# CATALOGUE
OF
# WELWITSCH'S AFRICAN PLANTS.
## VOL. II.—PART I.

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# CATALOGUE

OF THE

# AFRICAN PLANTS

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## DR. FRIEDRICH WELWITSCH IN 1853-61.

VOLUME II. PART I.

## MONOCOTYLEDONS AND GYMNOSPERMS.

BY

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# MONOCOTYLEDONS.

## I. HYDROCHARIDEÆ.

1. **LAGAROSIPHON** Harv.; Benth. & Hook. f. Gen. Pl. iii. (part 2, Apr. 1883) p. 450.

1. **L. rubellus** Ridl. in Journ. Linn. Soc. xxii. p. 234; Durand & Schinz, Consp. Fl. Afr. v. p. 2; Wright in Fl. Trop. Afr. vii. p. 3.

Huilla.—Habit of *Ceratophyllum*, inhabiting the rivers in great masses, herbaceous-green, stems densely cæspitose, elongated, 3 to 5 ft. long, purplish, slender, leaves opposite, linear; flowers dicœcious, with a long (3 to 8 in.) capillary tube, at the time of pollination floating on the surface of the water, reddish, very small, trimerous? Ovary many-ovuled, subsessile within a tubular spathe with gaping apex in the leaf-axils. Plentiful in the river Quipumpunhime and other deeper streams round Humpata and Ohai, growing along with species of *Utricularia* and *Potamogeton*; fl. and fr. April 1860. Nos. **6472**, **6472***b*.

2. **BLYXA** Thou.; Benth. & Hook. f. Gen. Pl. iii. p. 451.

1. **B. radicans** Ridl. in Journ. Linn. Soc. xxii. p. 236, t. 14; Durand & Schinz, Consp. Fl. Afr. v. p. 3; Wright in Fl. Trop. Afr. vii. p. 6.

Huilla.—A perennial herb, dicœcious; male flowers 6-androus, petals white, sepals herbaceous; female flowers with white petals, a little longer and narrower than the male. Fruit a long cylindrical berry. Plentiful in masses in the clear streams near Lopollo, especially at the Cataracts; somewhat rarely flowering. Not seen elsewhere in Angola and Benguella. In fl. and with unripe fr. beginning of May 1860. No. **6471**.

3. **OTTELIA** Pers.; Benth. & Hook. f. Gen. Pl. iii. p. 453.

1. **O. lancifolia** Rich. Tent. Fl. Abyss. ii. p. 280, t. 95 (1851); Ridl. in Journ. Linn. Soc. xxii. p. 238; Durand & Schinz, Consp. Fl. Afr. v. p. 4; Wright in Fl. Trop. Afr. vii. p. 7.

Ambaca.—Plentiful in lake to the left of the river Caringa. In fl. and fr. June 1855. No. **6466**.

Var. **fluitans** Ridl., *l.c.*; Durand & Schinz, *l.c.*; Wright, *l.c.*

Pungo Andongo.—An elegant herb, swimming; with fibrous root. Flowers very delicate, very fragile when dry, intensely yellow. Plentiful with species of *Nymphæa* in ponds on the lofty rocks of the præsidium. Pedra Songue, on the lower ridge. In fl. middle of February, in fr. April 1857. No. **6468**.

2. **O. plantaginea** Welw. ex Ridl., *l.c.*; Durand & Schinz, *l.c.*; Wright, *l.c.*

HUILLA.—Spathes with numerous acute teeth; flowers yellow; root-fibres copper-coloured, shining. In masses in ponds close to the river-banks near Catumba, where the camp of the Monani was formed at the time of the invasion. April 1860. No. **6469**.

3. **O. vesiculata** Ridl., *l.c.*, p. 237; Durand & Schinz, *l.c.*; Wright, *l.c.*

HUILLA.—An acaulescent herb ½ to 2 ft., with 6-androus, 7-carpellary yellow flowers which at time of pollination float on the surface of the water; styles several or all bifid. Spathe loosely enclosing the fruit, inflated, filled with water, compressed, broadly ovoid, purple-banded on the outside, mouth bidentate finally torn. Leaves originally somewhat stiff, fragile, bright pellucid green; scape slightly flattened, shortly 2-winged, gradually thickened a little below the spathe, tetragonal, lateral angles acutely winged. Ovary in the several fruits examined always incompletely 9-locular. Plentiful in slowly flowing streams and clear ponds near Lopollo, Mumpulla, etc., along with species of *Myriophyllum*, *Isnardia*, *Nymphœa* and *Potamogeton*. In fl. end of Oct. 1859; in fl. and fr. April 1860. No. **6467**.

4. **O. crassifolia** Welw. ms.

*Boottia crassifolia* Ridl., *l.c.*, p. 239; Durand & Schinz, *l.c.*; Wright, *l.c.*, p. 9.

As the flowers are ♀ and solitary in the spathes, the species belongs to the genus *Ottelia*, as Welwitsch suggested, and not to *Boottia*.

HUILLA.—A fleshy subrigid herb, growing erect from the muddy bottom, hidden 1 to 2 fathoms deep in flood-time. Leaves 2 to 3 ft., erect. Flowers yellow. Fruit flattened cylindrical, deeply 7-furrowed on both sides. Rather rare in the deeper ponds and streams round Mumpulla and Lopollo, only flowering in almost dried-up ponds. In fr. Oct. 1859, in fl. and fr. April 1860. No. **6470**.

## II. BURMANNIACEÆ.

1. **BURMANNIA** L.; Benth. & Hook. f. Gen. Pl. iii. p. 457.

1. **B. bicolor** Mart. Nov. Gen. et Sp. i. p. 10, t. 5, fig. 1 (1824).

Var. **africana** Ridl. in Journ. Bot. 1887, p. 85; Wright in Fl. Trop. Afr. vii. p. 11.

HUILLA.—An annual very slender herb one digit high. Leaves and stem herbaceous-green, upper part of stem purplish. Flowers deep blue or deep violet marked with bright yellow, terminal, 3 or 4 together. In spongy wooded meadows of Monino with species of *Eriocaulon*, *Xyris*, *Primula*, and *Scleria*, fairly plentiful where it occurs, but found only in a few localities. In fl. and fr. Feb. 1860. No. **6473**. Gregarious in a few localities in lofty spongy places, and in rather damp sandy places, at Morro de Lopollo, near Sambo, growing along with grasses, in rocky places covered with a thin but rich soil. In fl. April and May 1860. Nos. **6474**, **6474***b*. Marshy places Lopollo; in fr. Feb. 1860. COLL. CARP. 68.

# III. ORCHIDEÆ.

## Tribe I. *EPIDENDREÆ.*

1. **LIPARIS** L. C. Rich.; Benth. & Hook. f. Gen. Pl. iii. p. 495.

1. **L. Guingangæ** Rchb. f. in Flora 1867, p. 103; Ridl. in Journ. Linn. Soc. xxii. p. 274; Durand & Schinz, Consp. Fl. Afr. v. p. 9; Rolfe in Fl. Trop. Afr. vii. p. 22.

Huilla.—On mossy slopes at Morro de Monino, but a *rara avis*. Subsequently sought in vain. Flowers whitish to pale yellow. March and beginning of April 1860. No. **723**.

2. **L. Welwitschii** Rchb. f. in Flora 1865, p. 184; Ridl., *l.c.*, p. 280; Durand & Schinz, *l.c.*, p. 10; Rolfe, *l.c.*, p. 21.

Golungo Alto.—Very rare in wet palm-groves on the right of the river Quiapoze near Sange. In fl. and fr. July 1855. No. **660**.

2. **BULBOPHYLLUM** Thou.; Benth. & Hook. f. Gen. Pl. iii. p. 501.

1. **B. andongense** Rchb. f. in Flora 1865, p. 184; Durand & Schinz, *l.c.*, p. 10; Rolfe in Fl. Trop. Afr. vii. p. 31.

Pungo Andongo.—Terrestrial growing on rocks, creeping, pseudobulbs crowded in a series, ovate-conical, acutely 4-angular. Leaves thickly coriaceous, herbaceous-green, oblong-lanceolate. Flowers crimson, laxly arranged in very long nodding or pendulous spikes, very elegant, resembling a little feather variegated with white and purple. On the vertical rocks of the præsidium near Catete, very inaccessible. In fl. Jan. 1857. No. **689**.

2. **B. rupincola** Rchb. f., *l.c.*; Durand & Schinz, *l.c.*, p. 14; Rolfe, *l.c.*, p. 33.

Pungo Andongo.—Terrestrial, very widely cæspitose, bulbs very thick, angled. On sunny rocks Feb. 1857. No. **697**. March 1857. Coll. Carp. 998.

## Tribe II. *VANDEÆ.*

3. **EULOPHIA** R. Br.; Benth. & Hook. f. Gen. Pl. iii. p. 535.

1. **E. Ledienii** Stein in Jahresber. Schles. Gesell. Vaterl. Cult. 1886, p. 254 (nomen); N. E. Brown in Kew Bull. 1889, p. 90; Rolfe in Fl. Trop. Afr. vii. p. 50.

*E. maculata* Rchb. f. (in part) in Flora 1867, p. 103; Stein in Gartenfl. 1888, p. 609, t. 1285; Durand & Schinz, Consp. Fl. Afr. v. p. 23. *Eulophidium maculatum* Pfitzer in Engl. & Prantl Pflanzenfam. ii. Abth. 6. p. 188.

Golungo Alto.—Terrestrial, bulbophyllous, creeping; leaves broadly lanceolate, fleshy, very stiff, obscurely green, with white spots, erect to spreading. Scapes sheathed, two-edged, leafless, a span or a foot long, erect, somewhat firm, springing from the base of the new leaf. Flowers rose-white. Perianth spreading, outer segments free, lanceolate, spathulate, dirty white, a little longer than the inner, the two lower curved falcately downwards; inner a little broader than the outer,

quite white, erect. Lip white, spreading, spurred (spur 2½ to 3 lines long, reddish, with a yellow globular swollen apex), 4-lobed, lobes obtuse, posterior erect red-margined, with purple streaks, smaller, anterior larger, spreading deflexed, marked on the base with an oblong purple spot. Column short, incurved from the base, rose-white, semiterete, red-margined. Ovary a little twisted, channelled and ribbed. Very rare and sporadic in primitive woods by streams. Primitive forest of Quisuculo in fl. Jan. 1856, in fr. June 1855. Flowers violet-red. Very rare in very thick woods by streams at Mata de Quisuculo ; in fl. Dec. 1855. No. **661.**

2. **E. monile** Rchb. f., *l.c.*, p. 105 ; Durand & Schinz, *l.c.*, p. 24 ; Rolfe, *l.c.*, p. 53.

Huilla.—Tubers moniliform, white, compact; stem cylindric; leaves subrigid, striate, green ; flowers white, nodding, shortly spurred ; ovary scarcely twisted. Here and there in moss-grown shady places by streams on the heights (over 5000 feet) of Morro de Monino. Unique. In fl. Nov. 1859. No. **709.**

3. **E. Protearum** Rchb. f., *l.c.*, p. 104 ; Durand & Schinz, *l.c.*, p. 24 ; Rolfe, *l.c.*

Huilla.—Flowers yellowish, with a reddish tint. Perhaps only a poor form of the species under No. 720 (*E. Welwitschii*). Here and there in woods of Proteaceæ, in sandy shortly grassed places between Lopollo and Monino. Unique. In fl. beginning of Jan. 1860. No. **719.**

4. **E. aloifolia** Welw. ex Rchb. f., *l.c.* ; Durand & Schinz, *l.c.*, p. 19 ; Rolfe, *l.c.*, p. 55.

Pungo Andongo.—Very rare (only a single specimen seen) among shrubs on rocky slopes on the right of the river Cuanza near Candumba. End of March 1857. No. **682.**

5. **E. euglossa** Rchb. f. ex Batem. in Bot. Mag. t. 5561 (1866) ; Durand & Schinz, *l.c.*, p. 21 ; Rolfe, *l.c.*, p. 57.

Golungo Alto.—Stem narrow, 4 ft. long, raceme 2 ft. Terrestrial at the roots of shrubs in the very dense elevated (2000 ft.) primitive woods near streams at Banza de Quilombo. Very rarely seen. In fl. Jan. 1855. No. **671.**

6. **E. Welwitschii** Rolfe in Bolet. Soc. Brot. vii. p. 236 (1889) (non Hook. f. in Bot. Mag. sub t. 7330) ; Durand & Schinz, *l.c.*, p. 26 ; Rolfe in Fl. Trop. Afr. vii. p. 61.

*Orthochilus Welwitschii* Rchb. f. in Flora 1865, p. 186.

Huilla.—Erect 1 to 1½ ft. high ; tubercles triangular, white, thick and fleshy, fibres snow-white, flowers a fine scarlet, perianth bell-shaped, between spreading and pendulous, bracts orange-coloured. Somewhat plentiful in thickets and rather dry mountain districts 4000 to 5000 ft. high near Huilla, especially in little forests of Proteaceæ, Nov. 1859. In sandy places among Proteaceæ at Monino ; Jan. 1860. No. **720.**

7. **E. dichroma** Rolfe in Fl. Trop. Afr. vii. p. 62 (1897).

*E. bicolor* Rchb. f. & Sond. ex Rchb. f., *l.c.*, in part ; (non Blume).

*E. Welwitschii* Hook. f. in Bot. Mag. sub t. 7330 ; (non Rolfe).

Huilla.—Flowers very beautiful, sulphur-coloured. A marsh plant. Varzea do Ferrão da Sola in meadows inundated during the summer. Many flowers still in the water. Feb. 1860. No. **718.**

8. **E. Woodfordii** Rolfe, *l.c.*, p. 68.

*Cyrtopera longifolia* Rchb. f., *l.c.*, p. 189. *C. Woodfordii* Lindl. Gen. & Sp. Orch. p. 189.

Golungo Alto.—In herb-grown marshes on the banks of the river Casaballa, Sobato de Bumba, along with Mungo (*Mamboga stipulosa*) and species of *Fuirena*. 22 Oct. 1853. No. **664**.

9. **E. guineensis** Lindl. in Bot. Reg. t. 686 (1823); Durand & Schinz, *l.c.*, p. 21; Rolfe, *l.c.*, p. 59.

Golungo Alto.—Scape 1½ to 2 ft., 5- to 10-flowered; flowers subpendulous, *Serapias*-like, middle lobe of lip a beautiful rose-colour, disc marked with dark purple streaks, perianth-segments all similar, dull purple. Montalegres, Feb. 1855; woods near N-delle, May 1856. No. **656**.

4. **LISSOCHILUS** R.Br., Benth. & Hook. f. Gen. Pl. iii. p. 536.

1. **L. dilectus** Rchb. f. Otia Bot. Hamb. i. p. 62 (1878); Durand & Schinz, *l.c.*, p. 28; Rolfe in Fl. Trop. Afr. vii. p. 83.

*L. arenarius* Rchb. f. in Flora 1865, p. 188; (non Lindl.).

Pungo Andongo.—3 to 3½ ft. high, rhizome of thick white subtrigonal moniliform tubers; leaves 1 ft. long; scape 2½ to 3 ft. or more, sheathing scales distant dark purple or livid. Flowers very large and fine, rose-coloured. Disc of labellum with a dark purple shortly bearded line, and two thick elevated crests at the mouth, cavity of labellum sheathed with purple on the inside, yellow outside. In damp thickets on the rivers Cuanza and Lopollo; Dec. 1856. No. **686**.

Golungo Alto.—Rather rare in schistose slopes on the banks of the river Múio between Bango and Quilombo; 14 Jan. 1855. Two specimens in flower. No. **666**.

2. **L. Paivæanus** Rchb. f. in Flora 1865, p. 187; Durand & Schinz, *l.c.*, p. 29; Rolfe, *l.c.*, p. 89.

Huilla.—Bulbs conical, green, very fleshy, erect, crowded, furnished at the base with numerous white fibres; leaves appearing after the flowers. Scape 2 ft., more rarely 3 ft., deep purple. Flowers beautiful, pendulous, sepals obovate-lanceolate, purplish, petals twice as large, a fine yellow; lateral lip-lobes dull purple erect, the median channelled, bright yellow, 2- or 3-toothed on each side. Column white. Plentiful in sandy thickets round Huilla. In fl. end of Oct. to middle of Nov. 1859. No. **731**.

Var. **stenophyllus** Rchb. f. in Flora 1867, p. 105; Durand & Schinz, *l.c.*; Rolfe, *l.c.*

Pungo Andongo.—2 ft. high, scape distantly sheathed, 2 ft. more rarely 3 ft. Flowers between spreading and nodding, sepals herbaceous-green with dull purple spots on the inside; petals deep sulphur-colour outside, within (or beneath) whitish; lateral lip-lobes pale, purple-streaked, median keel-like deep yellow, spur dull purple. Bracts yellowish-green. Rather rare in stony thickets at the base of Pedra Pungo on the præsidium. Beginning of March 1857. No. **690**.

3. **L. calopterus** Rchb. f. in Bonplandia iii. p. 218 (1855); Durand & Schinz, *l.c.*, p. 28; Rolfe, *l.c.*, p. 93.

Loanda.—2½ to 3 ft., leaves only well developed after the flowers; flowers a shining sulphur yellow. Plentiful but seen only in this

locality in Angola, on clay soil among Euphorbiaceæ, near Cacuaco, Barra do Bengo. Beginning of Jan. 1854. No. **652**.

4. **L. aurantiacus** Rchb. f. in Flora 1865, p. 187 ; Durand & Schinz, *l.c.*, p. 27 ; Rolfe, *l.c.*, p. 96.

Pungo Andongo.—Tubercles succulent, thick, subtriangular, depressed, two or several, moniliform united by a narrow isthmus, generally sending out first a flowering scape, then a cluster of leaves. Leaves glaucous-green, many times shorter than the scape ; scape erect, purplish, with few scales. Flowers nodding-pendulous ; sepals copper-coloured ; petals much larger ovate-orbicular, a deep bright yellow above, rose-coloured beneath, streaked with longitudinal purple veins ; labellum yellow-red. On sunny heights and shortly-grassed pasture slopes among gneiss rocks of the præsidium and near Cazella. In fl. Oct., Nov., Dec. 1856, in fr. Jan. 1857. No. **691**.

5. **L. Friderici** Rchb. f. in Flora 1867, p. 113 ; Durand & Schinz, *l.c.*, p. 28 ; Rolfe, *l.c.*, p. 88.

Ambaca.—2 ft. high ; flowers yellow, nodding, bi-coloured ; leaves and root not seen. On thicket-grown plains near Zamba, in places once cultivated now abandoned. Oct. 1856. No. **676**.

6. **L. angolensis** Rchb. f. Otia Bot. Hamb. p. 64 (1878) ; Durand & Schinz, *l.c.*, p. 27 ; Rolfe, *l.c.*, p. 76.

*Cymbidium angolense* Rchb. f. in Flora 1865, p. 188.

Huilla.—Rhizome long, horizontal, creeping, succulent, as thick as a finger, sparsely fibrous, a dull cinnamon colour, producing at intervals of 10 or 12 in., leaf and scape-bearing nodes. Leaves during flowering period little developed, growing in an erect tuft close to the scape, and half its length or shorter, rigidulous ; scape 2 to 2½ ft. erect, striate-angular, dull purple, ending in a raceme, with distant scales below and in the middle. Bracts dull purple, ovary elongate-clavate, furrowed, moderately twisted ; sepals dull purple, petals a little wider, and like the column greenish-yellow ; lip deflexed, very obtusely saccate, scarcely lobed, longitudinally streaked with purple, crispulately wavy in fruit, livid-purplish. Rather rare in damp sunny places by streams near Quibbe and N-lala. In fl. beginning of Nov. 1859. No. **734**.

7. **L. giganteus** Welw. ex Rchb. f. in Flora 1865, p. 187 ; Durand & Schinz, *l.c.*, p. 28 ; Rolfe, *l.c.*, p. 87.

Golungo Alto.—Gigantic, tubers palmate compressed, copper-coloured, spongy, leaves radical, 4 to 5 ft., erect, palmlike ; scape 6 to 8 ft. high, erect, almost an inch thick at the base ; spike in the larger specimens 1½ ft. long, and rose-purple ; flowers very large. Boggy places by streams, Sobato de Quilombo and on the right of the Ambaca road near Camilungo ; in boggy and marshy places near Quilombo-Quiacatubia, at about 2200 ft. elevation ; in boggy places on the banks of the Cuango and elsewhere near Camilungo, growing along with *Typha angustifolia* and similar plants. In fl. beginning of Oct. 1856. Uppermost part of a stalk 2·7 metres high, with 35 flowers. Varzea do Indrio ; 30 April, 1856. No. **673**. Scape 8 to 11 ft. high. Coll. Carp. 996.

8. **L. Welwitschii** Rchb. f., *l.c.*, p. 188 ; Durand & Schinz, *l.c.*, p. 31 ; Rolfe, *l.c.*, p. 87.

Huilla.—A gigantic herb, 4 to 8 ft., with a spongy tuberous root,

and erect leaves 2 to 3 ft. long. Here and there in wooded boggy meadows, Monino, Jan. 1860. No. **710.**

5. **ANSELLIA** Lindl. ; Benth. & Hook. f. Gen. Pl. iii. p. 537.

1. **A. africana** Lindl. in Bot. Reg. 1844, sub t. 12 ; Rchb. f. in Flora 1865, p. 188 ; Durand & Schinz, Consp. Fl. Afr. v. p. 31 ; Rolfe in Fl. Trop. Afr. vii. p. 101.

Bumbo.—Leaves thick and stiff, leathery, yellowish-green, finely striated between the nerves ; panicle few-flowered, with nodding fruits. Plentiful on the tree called "Unteate" (*Copaiba Mopane*), Serra da Xella. In fr. middle of Oct. 1859. (Now cultivated in hort. Sander, London.) No. **711.** Coll. Carp. 999.

The determination of this plant by Reichenbach must be considered doubtful, as there are no flowers.

6. **POLYSTACHYA** Hook. ; Benth. & Hook. f. Gen. Pl. iii. p. 540.

1. **P. ensifolia** Lindl. in Journ. Linn. Soc. vi. p. 129 (1862) ; Rchb. f. in Flora, 1867, p. 114 ; Durand & Schinz, Consp. Fl. Afr. v. p. 34 ; Rolfe in Fl. Trop. Afr. vii. p. 108.

Golungo Alto.—Epiphytic on decaying tree-trunks in very lofty woods (2300 ft.) on Mt. Cungulungulo. With old fruit Feb. 1855. No. **670.**

The specimen thus determined by Reichenbach (*l.c.*) is in fruit only, and may be different, but the material is insufficient for more certain determination.

2. **P. tessellata** Lindl., *l.c.*, p. 130 ; Durand & Schinz, *l.c.*, p. 37 ; Rolfe, *l.c.*, p. 114.

Golungo Alto.—Epiphytic on fallen decaying trunks in the primitive woods of Cungulungulo. In fr. Feb. 1855. No. **655.**

Pungo Andongo.—A sporadic epiphyte on old trunks in Mata de Mutollo. Unique ; almost past flowering March 1857. No. **704.**

3. **P. modesta** Rchb. f., *l.c.* ; Durand & Schinz, *l.c.*, p. 35 ; Rolfe, *l.c.*, p. 116.

Pungo Andongo.—Stem with a swollen bulbous base, leaves rather fleshy to leathery, shining ; flowers yellowish. Epiphytic on older trunks (Muzamba) in primitive woods near Quisonde, but very rare. One specimen with fl. and old fr. March 1857. No. **675.**

4. **P. nitidula** Rchb. f., *l.c.* ; Durand & Schinz, *l.c.*, p. 36 ; Rolfe, *l.c.*, p. 118.

Golungo Alto.—A span or a foot high ; leaves leathery but not stiff, shining on both sides, erect to spreading. Flowers pale-purple or violet-purple, becoming much smaller in drying. A very rare epiphyte growing along with other orchids on branches of old Adansonias near the banks of the Cuango. In fl. Feb. 1856. No. **659.**

5. **P. golungensis** Rchb. f. in Flora 1865, p. 185 ; Durand & Schinz, *l.c.*, p. 35 ; Rolfe, *l.c.*, p. 18.

Golungo Alto.—Leaves hard, stiff, narrowly furrowed, falcately curved ; flowers yellow. The most plentiful epiphytic orchid of this

region ; often found on strong branches of Adansonia. Bank of river Coango Jan. 1856. No. **674**.

6. **P. Adansoniæ** Rchb. f., *l.c.* ; Durand & Schinz, *l.c.*, p. 33 ; Rolfe, *l.c.*, p. 121.

Golungo Alto.—A parasitic bulbophyllous herb, with bright green shining leathery leaves. Rather rare on the branches of old Adansonias near Delamboa. In fl. March, in fr. May 1855. No. **654**.

7. **P. angularis** Rchb. f. in Flora 1867, p. 114 ; Durand & Schinz, *l.c.*, p. 33 ; Rolfe, *l.c.*, p. 122.

Pungo Andongo.—Flowers deep yellow, rhachis of raceme hirtulous. Terrestrial on the higher parts of the præsidium, Pedra de Cazella, and of Cambondo, but somewhat rarely met with, and not seen below 3400 ft. In fl. Jan. 1857. No. **696**.

7. **ANGRÆCUM** Thou. ; Benth. & Hook. f. Gen. Pl. iii. p. 583.

1. **A. flabellifolium** Rolfe in Fl. Trop. Afr. vii. p. 135 (1897).

*Aërangis flabellifolia* Rchb. f. in Flora 1865, p. 191 ; Durand & Schinz, *l.c.*, p. 50.

Golungo Alto.—An epiphyte hanging like a candelabrum, leaves rosulate, thick, very stiff, fleshy-leathery, spathulate-lingulate. Outer and inner leaves of the spreading perianth subequal, distant, lanceolate, long-acuminate, pale greenish, with a lacquer-like polish, obsoletely nerved. Lip very similar, slightly longer ; spur long, hyaline-fleshy, gradually tapering, with a subobtuse apex. Column hyaline-whitish, erect, less than half the length of the perianth-leaves, semiterete, with a single anterior tooth at the base. Pollinia 2, ovate-elliptical pale yellow. On densely leaved trees at the cataracts of the Cuango, but very rare. Only three specimens seen, and three flowers. In fl. 4 Dec. 1854 and 31 Oct. 1855 ; in fr. June 1856. No. **657**. In the shady woods of the Serra de Alto Queta on the bank of the river Luinha. A single leaf. No. **742**.

2. **A. Galeandræ** Rchb. f., *l.c.*, p. 189 ; Durand & Schinz, *l.c.*, p. 43 ; Rolfe, *l.c.*, p. 136.

Golungo Alto.—Several individuals growing together and suspended from branches by their numerous densely intertwined roots, leaves and racemes pendulous. Leaves opaque green above, not shiny, paler beneath. Perianth white, with a wine-red tinge ; lip ventricose, with wine-red streaks on the inside, and gaping mouth, middle lobe with fimbriate crenate and wavy apex, lateral lobes very blunt, spur conical with drawn-out inflexed tip. Outer lateral perianth-segments obliquely lanceolate obtuse, the two inner segments acuminate. Rather rare on a *Sterculia* near the banks of the river Cuango, in fl. 5 April 1856. In damp woods, Monte de Queta, with unripe fruit, end of July 1856. No. **658**.

3. **A. tridactylites** Rolfe in Gard. Chron. iv. (1888) p. 34, in Fl. Trop. Afr. vii. p. 147.

*A. armeniacum* Rchb. f., *l.c.* (non Lindl.) ; Durand & Schinz, *l.c.*, p. 39.

Pungo Andongo.—A terrestrial herb with decumbent stem and fleshy firm aërial roots. Flowers whitish-strawcolour. On damp shady rocks in the woods of Barrancos de Songue. In fl. beginning of May 1857. No. **685**.

4. **A. guyomanum** Rchb. f. in Linnæa xxii. p. 865 (1849); Rolfe in Fl. Trop. Afr. vii. p. 148.

*Aëranthus guyomanus* Rchb. f. in Flora 1865, p. 190.

Golungo Alto.—A small apparently leafless herb growing on the branches of Mungo (*Mamboga stipulosa*), attached to the bark by very numerous flattened, furrowed, glaucous, anastomosing aërial roots. Capsules reddish-orange. On trees (Muguenga ia muxito) (Urticaceæ) near the river Cuango, and more plentiful on young and old Mungo trees near the river Casabella in Sobato de Bumba. In fl. May 1856, in fr. end of Oct. 1855. No. **653**.

The following numbers may belong to this genus, but in the absence of flowers their determination is impossible:—

Pungo Andongo.—Habit of some species of *Saccolabium*. A small shrub a foot high, growing erect on old lichen-grown trunks of Mimosas. Leaves coriaceous, thick and fleshy, spreading in two rows, glaucescent, unequally bilobed at the apex. Fruit acutely triangular. Primæval Mimosa woods between Quisonde and Condo near the river Cuanza. In fr. March 1857. No. **698**.

Pungo Andongo.—A small shrub 1½ ft. high, growing erect on the lichen-covered trunks of Mucamba (see No. 571 under *Brachystegia tamarindoides*), stem becoming woody, leaves distichous, arcuate, glaucous, coriaceous to fleshy, rather stiff, apex unequally bilobed. Fruit (unripe) six-angled, angles subobtuse. Mimosa woods between Condo and Quisonde not far from the river Cuanza. In fr. March 1857. No. **700**.

Island of St. Thomas.—Epiphytic on old tree-trunks in the more elevated woods near Fazenda do Monte Caffé. Without fl. Dec. 1860. No. **705**.

Bumbo.—Epiphytic on low trees covered almost completely with lichens and mosses, on the heights of Serra da Xella. Without fl. Oct. 1859. No. **706***a*. This orchid and a single specimen of an *Ansellia* were the last epiphytic orchids found on the ascent to the Huilla plateau (about 3900 to 4000 ft. above sea level). From that height towards the east and higher up orchids became more plentiful with every mile, but they were all terrestrial. Lopollo, May 1860. A small cæspitose epiphytic shrub, growing along with species of *Usnea* and Mosses on trees on the rocky heights of Serra da Xella. In fr. June 1860. No. **706***b*.

Pungo Andongo.—A rigid herb, leaves unequally bifid at the apex, bright green on both sides. Epiphytic and apparently rather scarce on living tree-trunks near the bank of the river Lombe. A unique specimen, past flower March 1857. No. **741**.

8. **LISTROSTACHYS** Rchb. f.; Benth. & Hook. f. Gen. Pl. iii. p. 583 (under *Angræcum*).

1. **L. muscicola** Rolfe in Fl. Trop. Afr. vii. p. 158 (1897).

*Aëranthus muscicola* Rchb. f. in Flora 1865, p. 190. *Mystacidium muscicolum* Durand & Schinz, Consp. Fl. Afr. v. p. 54.

Pungo Andongo.—A herb or might almost be called a shrub, terrestrial, densely cæspitose, stems erect, aërial roots very many densely woven. Leaves herbaceous-green. Flowers white, finally yellow, smelling very sweetly of Narcissus, long persistent. Very well worth cultivating. In the more lofty rocks of Tunda, Quilombo, on the præsidium. In fl. April 1857. No. **699**.

2. **L. rhipsalisocia** Rolfe, *l.c.*

*Angræcum rhipsalisocium* Rchb. f., *l.c.*, p. 189; Durand & Schinz, *l.c.*, p. 45.

GOLUNGO ALTO.—A herb epiphytic on older trees ; leaves very stiff, flabellate. Flowers a whitish sulphur-colour. Lofty primitive woods, Sobato de Quilombo, on *Sterculia acuminata* (Cola) and Spondiaceæ. In fl. March 1856. No. **662**.

3. **L. Papagayi** Rchb. f., *l.c.*; Durand & Schinz, *l.c.*, p. 49; Rolfe, *l.c.*, p. 159.

PRINCE'S ISLAND.—A pendulous shrub, hanging from the rocks, with stems 10 to 15 ft. long, very slender, leaves alternate, coriaceous, thick shiny and rigid ; flowers racemose, pale cinnamon. On the shady rocky heights (about 3000 ft.) of Pico de Papagaio. In fl. Sept. 1853. No. **629**.

4. **L. fragrantissima** Rchb. f., *l.c.*; Durand & Schinz, *l.c.*, p. 49 ; Rolfe, *l.c.*, p. 164.

PUNGO ANDONGO.—A small erect or ascending shrub, densely cæspitose, hanging from branches of trees or on the very dry slopes of the loftier rocks forming a thick and extensive growth in March and April decked with numerous very sweet-scented flowers. These orchid hedges alternate with others formed of Vellosiaceæ, with the spaces between filled with *Rhipsalis*, *Sarcostemma*, *Euphorbia*, *Stapelia*, and grasses. Flowers white or yellowish straw-coloured, racemes a foot long, pendulous or nodding, leaves greenish-yellow. The raceme is almost cylindrical, the flowers being opposite or in whorls of three ; their texture is almost that of wax, somewhat transparent ; spur scimitar-shaped, laterally compressed erect like the lip. On the rocky heights of Pedra Cabonda, up to 3400 ft., on the præsidium. In fl. April 1857. Nos. **701**, **702**.

5. **L. Welwitschii** Rchb. f., *l.c.*, p. 190 ; Durand & Schinz, *l.c.*, p. 50 ; Rolfe, *l.c.*

PUNGO ANDONGO.—A shrub 3 to 5 ft. high, erect, hard and woody, with far-descending woody-fibrous axillary aërial roots, forming very dense thickets ; leaves nearly 1 ft. long, very thick and hard, apex obliquely obtuse, a glaucous yellow-green colour almost like gold. Flowers in axillary racemes, looking as if made of wax, the size of those of *Orchis mascula*, very sweet-scented especially at evening. Ovary not twisted, short, at first facing the hollow of the rhachis then deflexed. Very plentiful on the more lofty sunny gneiss rocks of the præsidium, flowering from Jan. to April. In fl. and unripe fr. March 1857. No. **703**.

6. **L. iridifolia** Rolfe, *l.c.*, p. 167.

"*Angræcum* ? aff. *A. saccifero* Lindl. ?" Rchb. f., *l.c.*, p. 189. Fruiting specimens only.

GOLUNGO ALTO.—Small, cæspitose, almost acaulescent, leaves thick, cartilaginous, stiff, linear-lanceolate, distichous, arcuately recurved, short, veined ; flower spikes a little longer than the leaf, basal, distichous, pendulous. On the higher branches of a *Sterculia* called Quibondo, but very rarely met with, near the river Delamboa. In ripe fr. at the end of August 1856. No **679**.

7. **L. dactyloceras** Rchb. f., *l.c.*, p. 190; Durand & Schinz, *l.c.*, p. 49 ; Rolfe, *l.c.*, p. 168.

PUNGO ANDONGO.—A fleshy herb 3 to 5 in. high. Leaves bright green, flabellate. Flowers crowded, corymbosely spicate, white except

the green gynandrium, with subfleshy membranous white bracts. Outer perianth-leaves concave, forming with the inner a hood; lip descending. Ovary acutely angled, straight, not twisted. Bracts broad, sheath-like, dull-coloured, scarious. Plentiful on the lichen-covered bark of Mimosas (Muzamba) in the Panda forests, near the great cataract of the Cuanza, and on Calemba Islands. March 1857. No. **677**.

9. **MYSTACIDIUM** Lindl.; Benth. & Hook. f. Gen. Pl. iii. p. 584.

1. **M. xanthopollinium** Durand & Schinz, Consp. Fl. Afr. v. p. 55 (1895); Rolfe in Fl. Trop. Afr. vii. p. 173.

*M. erythropollinium* Durand & Schinz, *l.c.*, p. 52. *Aëranthus xanthopollinius* Rchb. f. in Flora 1865, p. 190. *A. erythropollinius* Rchb. f., *l.c.*

Golungo Alto.—Stem hard, woody, 3 to 5 ft. high; leaves shining above, glaucous-green beneath. Flowers in nodding racemes, 2 to 4 in. long, looking as if made of white wax. Plentiful in dense woods, covering the Adansonia stems with a thick beard; especially on river banks. In fl. Cuango river, end of March 1856. No. **665**. Forming dense thickets on the thicker branches of trees, with far-descending branches, branchlets and very long branching aërial roots. Flowers like wax, a very pale sulphur-white, with but little scent. Primitive woods of Mata de Pungo and near Cabondo. In fl. April 1857. No. **678**.

## Tribe III. *NEOTTIEÆ*.

10. **CORYMBIS** Thou.; Benth. & Hook. f. Gen. Pl. iii. p. 591.

1. **C. Welwitschii** Rchb. f. in Flora 1865, p. 183; Durand & Schinz, Consp. Fl. Afr. v. p. 56; Rolfe in Fl. Trop. Afr. vii. p. 180.

Cazengo.—A terrestrial herb 2½ to 3 ft. high, with the habit of *Cephalanthera*. Stem hard, very tough. Leaves almost always devoured or mutilated by insects, papery, dark green. Flowers whitish-green. Outer perianth-segments herbaceous-green, linear-spathulate, equal, the two inner of the same shape but whitish-green, all membranous subflaccid; column snow-white, rather fleshy. In very lofty primæval woods on Mt. de Muxaula, in especially shady places, but very rarely met with. In fl. 17 June 1855. No. **668**. In especially shady places on Mt. Cungulungulo, leaves only, 1 Feb. 1855. No. **667**.

11. **ZEUXINE** Lindl.; Benth. & Hook. f. in Gen. Pl. iii. p. 599.

1. **Z. africana** Rchb. f. in Flora 1867, p. 103; Durand & Schinz, Consp. Fl. Afr. v. p. 57; Rolfe in Fl. Trop. Afr. vii. p. 181.

Golungo Alto.—A span high, erect. Caudex subterranean, creeping, fleshy, sending out cylindrico-clavate tubercules. Stem cylindrical, reddish at the base, ringed with the bases of scales, becoming glaucous above. Leaves linear, erecto-patent, glaucous, with a long-sheathing base. Flowers whitish-green. Bracts foliaceous. Apparently very rare in reedy boggy places on the banks of the Coango; a single specimen in flower, and a second with no flower at the end of Feb. 1856. No. **669**.

12. **PLATYLEPIS** A. Rich. ; Benth. & Hook. f. Gen. Pl. iii. p. 604.

1. **P. glandulosa** Rchb. f. in Linnæa xli. p. 62 (1877); Rolfe in Fl. Trop. Afr. vii. p. 184.

*P. angolensis* Durand & Schinz, Consp. Fl. Afr. v. p. 58. *Diplogastra angolensis* Welw. ex Rchb. f. in Flora 1865, p. 183.

Golungo Alto.—A herb a foot high ; roots filiform fleshy, stem rooting below, leaves membranous ; flowers densely spicate, spike ovate, bracts large, densely pilose glandular on the outside, flowers white, subringent. Plentiful, but seen only in this one locality, in very shady palm-groves on the banks of the river Delamboa. Habit and mode of growth exactly that of our *Goodyera repens*. In fl. April and May 1855. No. **672**.

13. **POGONIA** Juss. ; Benth. & Hook. f. Gen. Pl. iii. p. 615.

1. **P. umbrosa** Rchb. f. in Flora, 1867, p. 102 ; Durand & Schinz, Consp. Fl. Afr. v. p. 59 ; Rolfe in Fl. Trop. Afr. vii. p. 186.

Island of St. Thomas.—A herb sending out a large kidney-shaped leaf from a whitish fibrous tubercle-bearing rhizome. In the very shady primitive woods on the heights near Fazenda do Monte Caffé, about 1800 ft. Without flower. Dec. 1860. No. **739**.

2. **P. purpurata** Rchb. f. & Sond. ex Rchb. f. in Flora 1865, p. 184 ; Bolus, Orchids of South Africa i. t. 12 ; Durand & Schinz, *l.c.*, p. 59.

Pungo Andongo.—Root tuberous, leaf radical, cordate-ovate, fleshy, shining. Plentiful by streams in the woods at Quilongo. Without fl. Jan., Feb., March, and April 1857. No. **738**.

Distinguished from *P. umbrosa*, in which it is included in Fl. Trop. Afr. vii. p. 186, by its ovate not reniform leaf, which agrees with Bolus' figure cited above.

## Tribe iv. *OPHRYDEÆ*.

14. **HABENARIA** Willd.; Benth. & Hook. f. Gen. Pl. iii. p. 624.

1. **H. Welwitschii** Rchb. f. in Flora 1865, p. 179 ; Durand & Schinz, Consp. Fl. Afr. v. p. 88 ; Kränzl., Orch. Gen. & Sp. i. p. 201.

*H. cataphysema* Rchb. f. in Flora 1867, p. 101 ; Durand & Schinz, *l.c.*, p. 74 ; Kränzl, *l.c.*, p. 217.

Huilla.—A herb, 2 feet high, with two tubers, the younger stalked, stem angular, straight, leaves herbaceous-green, lanceolate-linear, sepals greenish, petals white, thinly membranous ; spur green, descending, with a thickened club-shaped end. Bracts green. Ovary green, elongated, club-shaped. Here and there in wet pastures by streams between Lopollo and Humpata. In fl. Jan. 1860. No. **721**. Flowers greenish, buds reddish. Rather damp wooded pastures between Lopollo and Ohai. In bud Feb. 1860. No. **722**. Tubers ovate-conical. Flowers greenish, interior segments and lip filiform, cylindrico-subulate. Here and there in lofty damp meadows of Morro de Monino. In fl. beginning of April 1860. No. **743**.

I cannot distinguish the two Reichenbachian species included here. No. 722 is a small plant with comparatively young flower-buds, and

its determination must therefore be doubtful; but No. 743, of which we have in Herb. Mus. Brit. an excellent sketch and a single opening flower, is identical with No. 721 (*H. Welwitschii* Rchb. f.). Kränzlin places the two species in different sections (3 and 4 respectively), but there is very little distinction between the sections.

2. **H. tentaculigera** Rchb. f. in Flora 1867, p. 101; Durand & Schinz, *l.c.*, p. 86; Kränzl., *l.c.*, p. 205.

Huilla.—Older tubers hollow and chambered by transverse lamellæ. Stem and rhachis of spike angled. Leaves fleshy, herbaceous-green, carinate; bracts and flower herbaceous-green, the lip only somewhat yellowish. Ovary deeply furrowed. Here and there in lofty thickets at 5200 ft., Morro de Lopollo. In bud and flower Feb. 1860. A poorer few-flowered form, on thicket-grown sandy wooded hills between Ohai and Gambos. In fl. March 1860. No. **716**.

3. **H. robusta** Welw. ex Rchb. f., *l.c.*, p. 102; Durand & Schinz, *l.c.*, p. 85; Kränzl., *l.c.*, p. 216.

Pungo Andongo.—A herb 4 ft. high or more, stem and leaves subglaucous, flowers whitish-green, with a strong goat-like smell. Rather rare and sporadic in wooded thickets Sobato de Quibanga. A unique specimen; in fl. Jan. 1857. No. **695**.

4. **H. huillensis** Rchb. f. in Flora 1865, p. 179; Durand & Schinz, *l.c.*, Kränzl., *l.c.*, p. 220.

Huilla.—A herb 1½ ft. high with habit of *Platanthera*, with two tubers, one stalked; stem angled, leaves sheathing, herbaceous-green, perianth-segments and long spur all greenish-yellow. Here and there in marshy herb-grown places near streams in the way from Lake Ivantâla to Quilongulo; in fl. Feb. 1860. No. **724***a*. Here and there in short-grassed rather damp pastures near Catumba, end of March 1860. No. **724***b*. Flowers white, bracts slightly greenish. In wooded meadows between Monino and Ivantâla April 1860. No. **724***c*.

The flowers of No. 724*c* are a little larger and the anterior division of the petals is broader in proportion than in the other two specimens

5. **H. anaphysema** Rchb. f. in Flora 1867, p. 101; Durand & Schinz, *l.c.*, p. 73; Kränzl., *l.c.*, p. 225.

Huilla.—Leaves and herbaceous-green stem as in *H. Welwitschii*, but leaves more flaccid, and almost subulate-acuminate. Outer perianth-segments deep green, with yellowish-red markings, inner greenish-yellow. Spur filiform descending, abruptly club-shaped at the end, and reflexed. Sporadic in rather damp thicket-grown pastures between Humpata and Nene. [No date.] No. **744**. Represented in Herb. Mus. Brit. by a sketch only, but evidently very near *H. Welwitschii*, of which Welwitsch suggests it may be a variety.

6. **H. occultans** Welw. ex Rchb. f. in Flora 1865, p. 178; Durand & Schinz, *l.c.*, p. 82; Kränzl., *l.c.*, p. 243.

Huilla.—A herb with two tubers, stem 1½ to 2 ft. long, erect, angled, leaves sheathing, nerves very prominent beneath. Flowers long-stalked, stalks more or less hidden within the leaf-sheaths; ovary trigonous, green; perianth yellow-greenish, lip-lobes sulphur-colour, the lateral ones deeply fimbriated. Spur 3 to 4½ in., hidden behind the bracts of the lower flowers. Plentiful but in one locality only, in marshy places by the stream at Humpata, and very rare near Lopollo. Dec. and Jan. 1859-60. No. **737**.

7. **H. ichneumonea** Lindl. Gen. & Sp. Orch. p. 313 (1835); Durand & Schinz, *l.c.*, p. 79; Kränzl., *l.c.*, p. 320.

Pungo Andongo.—A herb growing on rocks and on the earth, 1½ to 2 ft. high, root 2- to 3-tubercled, mother-tubercle ovate-oblong or obovate-conical, new ones spherical, long-stalked. Stem cylindrical 2- to 3-kneed and like the leaves erect subflaccid herbaceous-green. Flowers herbaceous-green, except the column and the inner perianth-segments which are white and petaloid. In crannies of lofty gneiss-rocks near streams, Pedra de Songue, middle of Jan. 1856. No. **681**.

8. **H. chlorotica** Rchb. f., *l.c.*,; Kränzl. in Engl. Bot. Jahrb. xvi. p. 145; Durand & Schinz, *l.c.*, p. 75.

Huilla.—Herbaceous, 1 or 1½ ft. high, the whole plant including flowers herbaceous-green, the lips alone tending slightly towards a dull yellow. Root with two elongated oblong tubers. Stem slender cylindrical, distantly leaved, leaves linear, sheathing, plicate, erect to spreading. Bracts scarcely different from the uppermost cauline leaves. Ovary scarcely furrowed, with raised ribs. Outer lateral perianth-segments lanceolate reflexed above the ovary, the posterior much shorter, ovate, erect, embracing the two inner lanceolate segments; lip with a very long linear-subulate spur, lobes linear, the middle a little longer than the lateral, all hanging down, rather fleshy, green to yellowish. Sandy rather dry thickets near the large hippopotamus lake, but very sporadic. In fl. Feb. 1860. No. **725**.

9. **H. Dregeana** Lindl. Ann. Nat. Hist. iv. p. 314 (1840); Kränzl., *l.c.*, p. 149.

Var. **calva** Rchb. f., *l.c.*, p. 179; Durand & Schinz, *l.c.*, p. 77.

Huilla.—A herb with two tubers, the younger shortly stalked, scarcely 1 ft. long, leaves radical, in an opposite pair, fleshy, stiff, cordate, bright green, appressed to the ground; stem straight, clothed for its whole length with small long-acuminate bract-like leaves. Flowers in a cylindrical spike, greenish, smelling like *Convallaria majalis* but less sweet. Bracts slightly exceeding the ovary. Perianth hooded, external segments herbaceous, the lateral semi-ovate reflexed, the uppermost ovate, erect, the inner white, deeply bifid. Lip hanging, white, deeply trifid, the middle segment the longest, spur long flattened-conical, with club-shaped apex. Column short, obtuse. Ovary sessile subclavate with three raised ribs, shorter than the spur. Very rare in woods on sandy soil with little shade and crowded with Leguminosæ, between Monino and lake Ivantâla. 9 April 1860. No. **732**.

10. **H. macrandra** Lindl. in Journ. Linn. Soc. vi. p. 139 (1862); Rchb. f., *l.c.*, Kränzl., *l.c.*, p. 160; Durand & Schinz, *l.c.*, p. 81.

Golungo Alto.—The whole herb glaucous-green, fragile; leaves with a regular wavy margin, resplendent above, pale subglaucous beneath. Nectary very long and pendulous. In specially shady primæval woods on the mountains of Queta but rare. May and beginning of June 1855. No. **663**.

11. **H. Spiranthes** Rchb. f., *l.c.*, p. 178; Kränzl., *l.c.*, p. 165; Durand & Schinz, *l.c.*, p. 86.

Pungo Andongo.—A herb about 1 foot long, narrowly erect, the whole plant herbaceous-green. Leaves carinate, subglaucous beneath. Outer lateral perianth-segments reflexed, the third forming with the

two inner an erect helmet. Lip trifid, segments fleshy, linear, the median slightly the longest. In sparsely grassed pastures at Pedra Songue and around Catete. Beginning of Dec. 1856. No. **684.**

12. **H. psiloceras** Welw. ex Rchb. f. in Flora 1867, p. 99; Kränzl., *l.c.*, p. 165; Durand & Schinz, *l.c.*, p. 84.

PUNGO ANDONGO.—A terrestrial herb 2 to 3 ft. long, roots fascicled, thick fleshy, hairy. Stem straight, cylindrical, covered all over by the leaf-sheaths. Leaves ovate-lanceolate with a cordate amplexicaul base, rather fleshy-coriaceous, shining on each surface, pale beneath, spreading, nerved, acutely carinate. Flowers entirely white, except for the greenish tip of the spur. Bracts foliaceous, greenish. Two outer perianth-segments, reflexed, spreading, the posterior larger erect, forming with the two inner a helmet. Lip reflexed, trifid, spur very long, pendulous, cylindrico-compressed, with a flattened dilated tip. Very rare in the shady crannies of the more lofty rocks of Pedro de Cazella. Two specimens in fl. middle of Jan. 1857. No. **680.**

13. **H. hircina** Rchb. f., *l.c.*, p. 100; Kränzl., *l.c.*, p. 166; Durand & Schinz, *l.c.*, p. 78.

HUILLA.—Tuber as large as a small hen's-egg and smelling strongly like a goat; stem solid whitish-green; leaves membranous, herbaceous-green, acutely keeled, gradually passing into the bracts. Perianth including spur a pale yellowish-green, lip hanging, yellowish-green. Sporadic in sandy thickets along with various Daphnoideæ and species of *Gladiolus*; 3800 to 5500 ft. Two specimens in fl. Jan. 1860. No. **736.**

14. **H. foliosa** Rchb. f., *l.c.*

Var. **epipactidea** Rendle.

*H. epipactidea* Rchb. f., *l.c.*; Kränzl., *l.c.*, p. 237; Durand & Schinz, *l.c.*, p. 77.

Distinguished from the South African type (*H. polyphylla* Kränzl, *l.c.*, p. 214) by its smaller size, laxer habit, less blunt leaves and the somewhat smaller bracts of the lax spike; the floral structure is identical except that the lateral petals are slightly narrower, having a more oblong form than in the type.

HUILLA.—Herb with habit almost of *Epipactis*, 1 to 1½ ft. long, erect, with two tubers; tubers elongated ovate-cylindrical, smelling like a goat. Stem acutely angled, leaves glaucous-green, herbaceous, ovate-lanceolate, sharply keeled, with raised nerves and rather wavy margin, erect-spreading. Ovary shortly stalked, deeply furrowed, sharply angled, green; bract green much shorter. Three outer perianth-segments whitish-green, lateral obliquely lanceolate, posterior concave-oblong, inner broadly ovate, white, somewhat larger and longer than the outer, oblique. Lip white, middle lobe produced, broadly linear, two lateral short; spur long, club-shaped, subobtuse, white at the base becoming from the middle upwards pale greenish. Gynostemium yellowish-green. In sandy-clayey marshes near the river Monino but sporadic. In fl. Feb. 1860. No. **735.**

Kränzlin proposed the name *H. polyphylla* on the ground that *H. foliosa* Rchb. f. (nomen in Flora 1867, p. 100) was antedated by the Indian species *H. foliosa* A. Rich. If however we regard Richard's plant as a variety of *H. digitata* Lindl. (see Fl. Brit. Ind. vi. p. 135), Reichenbach's name must be retained. In spite of the striking similarity between the two Reichenbachian species, Kränzlin separates them widely. In his arrangement *H. epipactidea* comes in section 22

(*Chlorinæ*) and *H. polyphylla* in section 33 (*Stenochilæ*), the former being species No. 237, the latter No. 336. This however is only one of many instances which go to prove the artificial character of some of the sections which he proposes for the genus.

15. **H. Guingangæ** Rchb. f. in Flora 1865, p. 179; Kränzl., *l.c.*, p. 207; Durand & Schinz, *l.c.*, p. 78.

PUNGO ANDONGO.—A herb 1 to 1½ ft., with two tubers, the older ovate-oblong, the younger much smaller, club-shaped, somewhat fleshy, but only increasing perceptibly after flowering; stem very slender, straight, 2- to 3-leaved, the remaining leaves sheath-like. Spike ovate, lax, flowers very deep orange, somewhat fleshy, wax-like. Two outer perianth-segments deflexed, the third forming with the two inner anteriorly one-toothed segments an erect helmet. Lip spreading, trifid, mid-lobe longer and broader, spur subangled, long, descending; ovary acutely 6-angled, deeply furrowed, more or less hidden behind the bracts. Rather rare in rich thicket-grown pastures at Barrancos de Catete. A few specimens in flower beginning of Dec. 1856. No. **692.**

16. **H. Protearum** Rchb. f. Otia Bot. Hamb. p. 57 (1878); Kränzl., *l.c.*, p. 215; Durand & Schinz, *l.c.*, p. 84.

*H. paludosa* Rchb. f. in Flora 1865, p. 178 (non Lindl.).

HUILLA.—A slender herb with two tubers; flowers greenish-white, lip yellowish. In sandy rather shady short-grassed places among Proteaceæ. Monino, Feb. 1860. No. **708.**

17. **H. calcarata** Benth. & Hook. f. Gen. Pl. iii. p. 622.

*Stenoglottis calcarata* Rchb. f. in Flora 1865, p. 180; Durand & Schinz, *l.c.*, p. 68. *Barlæa calcarata* Rchb. f. in Linnæa xli. p. 54.

HUILLA.—A herb, 1 foot high, with cylindrical rather fleshy fascicled roots; spike deep rose-colour. Leaves herbaceous-green. Near rivers in boggy places near the town of Huilla. In fl. end of Oct. 1859. No. **733.**

The following numbers appear to belong to the genus, but the material is insufficient for determination:—

PUNGO ANDONGO.—Buds green, tubercles with a strong smell, like a goat. Sporadic in rather damp steep places beneath the shade of *Cyathea angolensis* near Catete on the præsidium. One specimen Jan. 1857. No. **687.** Represented by a sketch of the plant, which is only in bud.

PUNGO ANDONGO.—A mutilated specimen. Buds whitish-green. Terrestrial in rather deeply grassed damp pastures by the river Cuanza near Sansamanda. One specimen Feb. 1857. No. **688.** Apparently near the last. Represented only by a sketch of a damaged or diseased plant which bears no flowers.

15. **SATYRIUM** Sw.; Benth. & Hook. f. Gen. Pl. iii. p. 629.

1. **S. trinerve** Lindl. Gen. & Sp. Orch. p. 344 (1838).

Var. **leucocomon** Rendle.

*S. leucocomos* Rchb. f. in Flora 1865, p. 182; Durand & Schinz, Consp. Fl. Afr. v. p. 96.

Of somewhat more robust habit than the Madagascar type, and with shorter lip and lateral sepals.

HUILLA.—A herb 2 to 2½ ft., with the habit of a European orchid, bitubercled; stem almost as thick as the little finger below, hollow,

clothed from base to apex with long-sheathing leaves bearing acutely prominent nerves. Spike pyramidal ending in a tuft of empty bracts, the whole excepting the ovaries a shining milk-white. Bracts at first erect, then just about flowering time spreading, finally subpendulous, far exceeding the ovaries, white, very acuminate, traversed by raised nerves; ovaries oblong, scarcely twisted, densely hairy. Two outer lateral perianth-segments flat, tube helmet-shaped with two dorsal basal spurs; two inner segments flat, narrow, looking forwards along with the strap-shaped lip, forming as it were a deeply trifid lip. Rather rare in sunny marshy places by streams near Lopollo. In fl. and fr. Nov. 1859. No. **728.**

2. **S. paludosum** Rchb. f., *l.c.*; Durand & Schinz, *l.c.*, p. 97.

Huilla.—A narrowly erect slender herb with two tubers, white flowers and dull purple bracts. Here and there by the stream of Ferrão da Sola, near Lopollo, in marshy meadows. Jan. 1860. No. **727.**

3. **S. Welwitschii** Rchb. f., *l.c.*; Durand & Schinz, *l.c.*, p. 99.

Huilla.—A herb 2 ft. and higher, with the habit of *Orchis latifolia*, stem somewhat hollow, and like the leaves herbaceous-green; flowers spotted with violet-purple; bracts purplish-green, acute, elongated, originally crowded and crest-like. A variety with milk-white flowers and a denser spike is also found. In marshy places by streams near Huilla, growing with *Ranunculus pinnatus* and *Salix hexandra*; in fl. Nov. 1859. Marshy places near Lopollo, Dec. 1859; Varzea do Ferrão da Sola, Nov. and Dec. 1859. No. **726.**

4. **S. Ivantalæ** Rchb. f., *l.c.*, p. 183; Durand & Schinz, *l.c.*, p. 96.

Huilla.—A herb with two tubers, with the habit of *Orchis militaris*, 1½ to 2 ft. high, the young tuber generally stalked, spherical, the older ovate, abruptly acuminate. Stem cylindrical, not very solid, leafy below, clothed above with sheath-like leaves. Lower leaves long-sheathing, elliptical or ovate-elliptical, rather fleshy, leathery, shining bright green, distantly nerved, paler beneath, 3 to 7 in. long, between erect and spreading, the upper ones appressed; bracts greenish-purple deflexed at flowering time; perianth white, with rose-coloured or rose-purple streaks, two-spurred; posterior lip concave, white on the outside, streaked inside with rose-purple; segments all white with rose-coloured streaks, linear-spathulate. Somewhat plentiful in marshy places round the great lake of Ivantâla, March 1860. Plentiful in grassy marshy places between Quilengues and Ivantâla, Feb. 1860. No. **729.**

5. **S. riparium** Rchb. f., *l.c.*; Durand & Schinz, *l.c.*, p. 98.

Huilla.—A herb with two tubers, 1½ to 2 ft. high, with strict habit; radical leaves two, cordate-ovate, subfleshy, appressed to the ground, cauline short with long sheaths; perianth a waxy-yellow; posterior segment with two spurs, spurs long, cylindrico-subulate. Very sparsely on the banks of streams at Humpata. Going off flower Jan. 1860. No. **730.**

16. **DISA** Berg.; Benth. & Hook. f. Gen. Pl. iii. p. 630.

1. **D. ochrostachya** Rchb. f. in Flora 1865, p. 181; Durand & Schinz, Consp. Fl. Afr. v. p. 105.

Huilla.—A herb with two tubers, flowers yellowish-white; bracts reddish, very beautiful. Morro de Lopollo; Monino; Jan., Feb. 1860. No. **712.**

2. **D. aurantiaca** Rchb. f. in Flora 1867, p. 98; Durand & Schinz, *l.c.*, p. 100.

HUILLA.—A herb with two large sublobed tubers, stem erect, 1 to 1½ ft. high, firm, green, clothed with long-acuminate scale-like greenish leaves. Ovary pale yellow-green, corolla a splendid orange colour. Here and there in lofty damp places near Quipaca, Morro de Lopollo. Middle of Nov. 1859. No. **713.**

Apparently very near the last species, but represented only by a sketch and part of a flower, from which it is impossible to arrive at a definite conclusion.

3. **D. equestris** Rchb. f. in Flora 1865, p. 181; Durand & Schinz, *l.c.*, p. 102.

HUILLA.—A bitubercled herb, 1 to 1½ ft. high, with the habit of *Orchis palustris*, stem solid; leaves radical springing from the secondary tuber soon after flowering, linear-lanceolate, plicate, half-a-foot long; bracts short obtuse, green-purple; stem spotted with green and purple near the tip; outer perianth-segments violet-purple, the lateral spreading, the posterior concave, hooded, passing into a long obtusely conical spur, and enveloping the two inner segments and the column; two inner segments erect, subspathulate, white, connivent, marked at the apex with an oblong purple spot; labellum together with the two outer segments deflexed, simple, narrowly obovate, white at the base, reddish-purple at the finely apiculate tip. In boggy marshy ground near streams with *Eriocaulon*, etc., on the heights (4000 to 4500 ft.) of Huilla; in fl. Nov. 1859. In damp meadow-land growing with species of *Sphagnum*, *Scleria*, and *Utricularia*, at an elevation of 5000 to 5400 ft., Morro de Lopollo, already past flowering, Feb. 1860. No. **717.**

4. **D. Welwitschii** Rchb. f., *l.c.*; Durand & Schinz, *l.c.*, p. 110.

HUILLA.—A herb 1 to 1½ ft. high, with two oblong tubers, leaves radical borne only on the young lateral tubers, short and almost sheath-like on the flowering stem, acuminate, somewhat stiff, glaucous, and passing gradually into the yellowish bracts. Spike dense, pyramidal, comose, finally oblong, a very bright scarlet, very beautiful. Two lateral sepals erecto-patent, hood spurred, erect, half embracing the two inner segments, which are semicircular with an erect orange-coloured spathulate appendage on the inner side. Lip descending, narrow-linear, shortly acuminate. Perianth a bright rose-scarlet except for the orange-coloured appendage of the inner segments. Plentiful in lofty boggy places 5000 to 5300 ft. at Morro de Lopollo. Jan. and Feb. 1860. No. **715.**

5. **D. versicolor** Rchb. f., *l.c.*; Durand & Schinz, *l.c.*, p. 110.

HUILLA.—A herb 1 to 2 ft., with two tubers, adult tuber 2- to 3-digitate, comparatively large, with a goaty smell. Leaves radical, 1 ft. long, lanceolate, obtusely carinate, borne only on the lateral tubers. Stem firm, solid, spotted with purple at the base like the leaf-sheaths; upper cauline leaves and bracts streaked with purple at the tip or throughout, point deep purple. Sepals whitish marked with crimson, the concave hood passing into a cylindrical purple spur, the lateral ones semi-ovate, spreading; petals subtriangular, greenish-orange margined with purple, looking forward, bright purple at the base; lip simple, narrowly spathulate-ligulate, with a subtruncate apex, descending, as long as the anterior sepals. As only the three rose-coloured sepals are seen in the bud, the orange-yellow petals appearing with the

opening of the flower, the very long spike appears yellow in the lower half passing into a deeper rose-colour towards the apex. The habit is almost that of *Aceras anthropophora*. Rather rare in lofty boggy places above 5000 ft. at Morro de Lopollo. In fl. Feb. 1860. No. **714**.

17. **BRACHYCORYTHIS** Lindl.; Benth. & Hook. f. Gen. Pl. iii. p. 632.

1. **B. pubescens** Harv. Thes. Capens. i. p. 35 (1859); Rchb. f. in Flora 1867, p. 98; Durand & Schinz, Consp. Fl. Afr. v. p. 115.

Pungo Andongo.—A herb 1½ ft. high, with the habit of *Epipactis*; leaves membranous, rather stiff with rather obscurely green thinly puberulous raised veins. Perianth white and flesh-coloured, lip rose-coloured. Terrestrial; very rare in the rocky rather damp thickets of Barrancos de Catete on the præsidium. In fl. Jan. 1857. No. **693**.

2. **B. Welwitschii** Rchb. f., *l.c.*, p. 99; Durand & Schinz, *l.c.*, p. 115.

Huilla.—A terrestrial herb 1 to 1½ ft. high, strict, bright green, tubers cylindrical, thick, fascicled, simple or lobed; flowers white, lip dull red; leaves long-acuminate with raised veins. Rather damp meadows Sobato de Humpata. In fl. Dec. 1859. No. **707**.

18. **DISPERIS** Sw.; Benth. & Hook. f. Gen. Pl. iii. p. 633.

1. **D. Reichenbachiana** Welw. ex Rchb. f. in Flora 1865, p. 180; Durand & Schinz, Consp. Fl. Afr. v. p. 120.

Pungo Andongo.—Terrestrial; plentiful but in one place only, on fallen decaying tree-trunks, Barrancos de Catete, flowers very rarely. A few specimens in fl. and several without fl. Jan. 1857. No. **694**.

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**Orchidea** indet.

Buds of an orchid with lingulate-spathulate very stiff leathery, emarginate, wavy-margined leaves. On the tree called "Munguenga ia muxito" (Urticaceæ) at the great cataract of the river Cuango. Oct. 1855. Coll. Carp. 997.

This may be an *Angræcum*, but the material consists only of two small dried-up fragments quite beyond determination.

## IV. SCITAMINEÆ.

### Tribe I. *ZINGIBEREÆ*.

1. **KAEMPFERIA** L.; Benth. & Hook. f., Gen. Pl. iii. p. 641.

1. **K. æthiopica** Benth. ex Ridl. in Journ. Bot. 1887, p. 131.

Var. **angustifolia** Ridl., *l.c.*; Durand & Schinz, Consp. Fl. Afr. v. p. 124.

Pungo Andongo.—A subglaucous herb, with tuberous root, tubers slender with a pleasant *Amomum*-like aroma. Leaves channelled, curved, subfleshy. Flower a deep rose-purple, as in *Orchis papilionacea* var. *rubra* Jacq., ultimately becoming blue on drying. Very plentiful in damp meadows near the right bank of the Cuanza from Sansamanda as far as Quisonde, probably flowering in May and June. A single specimen with one flower near Condo, March 1857. No. **683**. Grown in garden at Loanda where it bore leaves but no flowers; probably because the air at Loanda is too dry.

2. **AMOMUM** L. ; Benth. & Hook. f. Gen. Pl. iii. p. 644.

1. **A. Melegueta** Rosc. Scitam. t. 98 (1828) ; Ridl. in Journ. Bot. 1887, p. 130 ; Durand & Schinz, Consp. Fl. Afr. v. p. 126.

Prince's Island.—Flowers milk-white with a purple or rose-tint. Seeds used by the blacks as a kind of pepper. In the lofty shady primitive woods of Pico de Papagaio at 2500 to 3000 ft. In leaf and fl. Sept. 1853. No. **6459**.

Island of St. Thomas.—In the more lofty shady woods where it is also everywhere cultivated. Near the road to Monte Caffé, without fl. or fr. Dec. 1860. No. **6460**.

Var. **violacea** Ridl., *l.c.* ; Welw. Apont. p. 544 ; Synops. p. 30 ; Durand & Schinz, *l.c.*, p. 127.

Golungo Alto.—Native name "Dongos de Congo." Flowers violet-purplish. Everywhere by streams, Monte de Alta Queta. Jan. 1856. No. **6457**. The least aromatic of all the species of this genus observed by me in tropical Africa. Flowers a very pretty violet, corolla-tube closely transversely plicate on the back. Rather plentiful on the sides of the streams which run down from the high mountains to the Cuango, near Sange, and on the mountains of Queta at Zengas. Beginning of Nov. 1854. Banks of the Cuango, Jan. 1855. No. **6458**. (The true Dongos of the Congo.) Flowers white-violet, leafy stem 2 to 3 ft. high. Shady damp places near rivers. (Dongos de Congo.) Coll. Carp. 103.

2. **A. latifolium** Afzel. Remed. Guin. p. 5 (1813) ; Durand & Schinz, *l.c.*, p. 126.

The following numbers may belong to this species :—

Pungo Andongo.—Plentiful in ferruginous muddy soil in very shady thickets, Sobato Cabango Quiquetta ; without fl. middle of Jan. 1857. No. **6454**. Road from Cazella to Pungo Andongo, 18 Oct. 1856. No. **6454***b*.

3. **A. alboviolaceum** Ridl., *l.c.* ; Durand & Schinz, *l.c.*, p. 125.

Pungo Andongo.—A herb 2 to 3 ft. high ; stem erect ; leaves in two rows. Flowers whitish-violet, scentless. Very plentiful in thickets and thin woods, in sandy and clay soil on the right of the river Cuanza. In fl. Dec. 1856. No. **6453**.

4. **A. Danielli** Hook. f. in Hook. Journ. Bot. iv. p. 129 (1852) ; Ridl., *l.c.* ; Durand & Schinz, *l.c.*, p. 125.

Var. **purpureum** Hook. f., *l.c.*, vi. p. 294.

*A. Danielli* Hook. Bot. Mag. t. 4764, non Hook. f., *l.c.*, iv. p. 129.

Prince's Island.—Flowers scarlet. Shady places in the coast region, plentiful round S. Antonio, rather rare in the mountains. In leaf and fl. Sept. 1853. No. **6455**. Flowers a splendid scarlet. Leafy stems 4 to 5 ft. high. Sept. 1853. Coll. Carp. 986.

Island of St. Thomas.—In dense elevated woods. End of Dec. 1860. Coll. Carp. 96. Flowers scarlet. Dec. 1860. Coll. Carp. 987.

5. **A. erythrocarpum** Ridl., *l.c.*

*A. Danielli* var. *purpureum* Durand & Schinz, *l.c.*, p. 125, non Hook. f.

Island of St. Thomas.—Dec. 1860. No. **6449**.

Golungo Alto.—Fruit very large, scarlet; flowers not seen. In primæval wood near Banza, Sobato de Quilombo. Jan. and Feb. 1855. No. **6451**. A herb 5 to 12 ft. high, the whole plant aromatic; leaves shining, firm and leathery. Flowers a splendid yellow, helmet-shaped; capsule as big as a pigeon's egg, often even as big as a hen's, a splendid scarlet. Plentiful near streams on the densely leafy mountain heights; native name "Dongos." Sobati Quilombo and Queta. In fr. May, in fl. Nov. and beginning of Dec. 1855. No. **6456**. Flower golden. Dongos. Matas de Alta Queta, May 1855. Coll. Carp. 984. Flowers intensely yellow. Quilombo-Quiacatubia 1855. Coll. Carp. 1116.

Mata de Pungo.—No. **6452**.

Fruit twice as large and seeds four or five times as large as in the specimens of *A. Danielli* var. *purpureum*, in which it is placed by Durand and Schinz, *l.c.*, and from which it is also distinguished by its yellow flowers.

The following numbers may belong here, but in the absence of satisfactory material determination is impossible :—

Prince's Island.—Here and there in shady places growing with a scarlet-flowered *Amomum*. A single leaf. Pico de Papagaio, Sept. 1853. No. **6450**. Probably *A. Danielli* var. *purpureum*.

Barra do Bengo.—A tuberous herb, tuber scarcely aromatic. A single specimen without flower in places once cultivated near S. Antonio on the river Bengo; afterwards sought in vain; Dec. 1853. No. **6462**. Apparently near *A. erythrocarpum* Ridl., but represented only by a single leaf, and probably a distinct species.

Pungo Andongo.—A herb with a thick root, white straw-colour within and only slightly aromatic, leaves pleasantly aromatic, the narrowest of all the west tropical African Amomums. In woods, Mangue. Without fl. or fr. Jan. 1857. No. **6461**. Perhaps *A. Melegueta* Rosc.

Pungo Andongo.—Damp meadows. Near Cuanza. March 1857. A much damaged leaf and a few cylindrical roots; perhaps a new species. Coll. Carp. 985.

3. **ZINGIBER** Adans.; Benth. & Hook. f. Gen. Pl. iii. p. 646.

1. **Z. officinale** Rosc. in Trans. Linn. Soc. viii. p. 348 (1807); Ridl. in Journ. Bot. 1887, p. 129; Durand & Schinz, Consp. Fl. Afr. v. p. 128.

Golungo Alto.—Cultivated in some localities in the district. Without fl. August 1855. No. **6463**.

4. **COSTUS** L.; Benth. & Hook. f. Gen. Pl. iii. p. 646.

1. **C. afer** Ker in Bot. Reg. t. 683 (1823); Ridl. in Journ. Bot. 1887, p. 131; Durand & Schinz, Consp. Fl. Afr. v. p. 128.

Golungo Alto.—A herb usually 5 to 6 ft. high, stroboli as large as the cones of *Pinus maritima*, flowers white, limb a pretty rose-purple; stems almost always somewhat nodding; flower-scape occasionally rising directly from the rhizome and leafless, but densely covered with scales. Plentiful on river banks, hidden among huge grasses and almost always growing with a species of *Canna*. Cambondo, 19 Sept.

1854. By streams between Trombeta and Cambondo, and more plentiful by streams near the Mongolo Mts. Sept. 1857. No. **6464**.

2. **C. giganteus** Welw. ex Ridl., *l.c.*; Durand & Schinz, *l.c.*, p. 128.

Island of St. Thomas.—Root creeping, very thick, many-headed, sending out fibres on all sides. Barren stems 4 to 5 ft. high, leaves 1 to 2 ft., oblong-lanceolate, shining green, glaucous-green beneath, short-stalked, petiole long sheathing, sheaths closed, prolonged, and ligulate above the petiole insertion. Flowering scapes very straight, 3 to 6 or more from the same root, 6 to 8 or even 10 ft. high, a splendid green, clothed throughout with sheaths of the same colour, but with a reddish margin, bearing a terminal strobiliform spike $\frac{1}{4}$ to $\frac{1}{3}$ ft. in diameter, and nearly $\frac{1}{2}$ ft. long, bright polished scarlet. Flowers bright yellow, half-exserted. Plentiful by streams in primitive woods, 2000 to 2800 ft. high, on Monte Caffé. Flowering from Oct. to Feb. In fl. Dec. 1860. No. **6465**.

5. **RENEALMIA** Linn. f.; Benth. & Hook. f. Gen. Pl. iii. p. 648.

1. **R. africana** Benth. ex Hook. f. Icon. Pl. 1430 (1883); Ridl. in Journ. Bot. 1887, p. 132.

Golungo Alto.—A herb with a thick branched rhizome. Leaves almost membranous. Flower-spikes, or rather racemes, several, rising erect from the rhizome, a foot high; flowers laxly racemose, flesh-straw-coloured, bracts whitish-straw-coloured, acuminate. Fruit a many-seeded berry, obscurely trilocular. Rather plentiful in shady primitive woods, Sobato de Quilombo-Quiacatubia. In fl. and fr. Jan. 1855. Leafy stems 4 to 5 ft. high. Fruit a dark cinnamon, terminal tube orange-coloured; seeds pleasantly aromatic, wrapped in scarlet filaments. In fr., Mata de Quisuculo, April 1856. No. **6442**. An aromatic herb 4 to 5 ft. high, leaves broadly oblong shining, flower-spikes 1 to $1\frac{1}{2}$ span, white-ferruginous; berries oblong deep bluish, seeds enveloped among numerous fine wavy threads. Quisuculo, April 1856. Coll. Carp. 991.

## Tribe II. *MARANTEÆ*.

6. **THALIA** L.; Benth. & Hook. f. Gen. Pl. iii. p. 650.

1. **T. cœrulea** Ridl. in Journ. Bot. 1887, p. 132; Durand & Schinz, Consp. Fl. Afr. v. p. 130.

Pungo Andongo.—A herb with a fibrous root; stem 5 to 7 ft. high. Flowers blue, buds a glaucous violet-blue. Fruit a one-seeded berry. A very beautiful plant. In ponds on the river Cuanza near the Sobato N-bille. March 1857. No. **6444**.

2. **T. Welwitschii** Ridl., *l.c.*; Durand & Schinz, *l.c.*, p. 130.

Cazengo.—A herb 3 to 4 ft. high, glaucous-green, with leafless panicles and horizontal rhizome. Rather rare in wet places between Cacula and Dalatanda. In fl. June 1885. No. **6443**.

Pungo Andongo.—A herb 4 to 5 ft. high; bracts a subglaucous violet, flowers purple. By marshes in the woods of Mutollo. March 1857. No. **6445**.

Very near *T. geniculata* L.

7. **DONAX** Lour. Fl. Coch. Chin. i. p. 14.
*Clinogyne* Salisb. ; Benth. & Hook. f. Gen. Pl. iii. p. 651.

1. **D. purpurea** K. Schum. in Engl. Bot. Jahrb. xv. p. 440 (1893); Durand & Schinz, Consp. Fl. Afr. v. p. 131.
*Clinogyne purpurea* Ridl. in Journ. Bot. 1887, p. 132. *Maranta discolor* Welw. Synops. p. 43 (1862).

Golungo Alto.—A herb with perennial root, with several stems 2 to 3 ft. high, erect, slender, clothed by the leaf-sheaths. Leaves ½ to 1½ ft., ovate or oblong-ovate, the larger ½ to ⅔ ft. broad, glaucous-green, and pinnately streaked with white above, with a white bloom beneath, and a broad green margin on one side. Flowers purple. Berry globular, smooth, the size of a rather small pea, generally 2-seeded. Plentiful in primitive woods near rivers. In fl. and fr. Jan. and March 1855. Leaves covered beneath with a snow-like powder, except on the deep green edge of one side. Primitive woods at 2500 to 2800 ft. Feb. 1855. Flowers azure to almost blue-purple ; berry scarlet. Primitive forest of Quisuculo. In fl. and fr. March 1856. Native names, "N-Subi," "Tinsubi," or "Subi Capele." No. **6440**.

Cazengo.—Herb 5 to 8 ft. high, lower surface of the leaves white. By mountain streams. Jan. 1855. Coll. Carp. 992.

8. **TRACHYPHRYNIUM** Benth. in Benth. & Hook. f. Gen. Pl. iii. p. 651.

1. **T. violaceum** Ridl. in Journ. Bot. 1887, p. 133 ; Durand & Schinz, Consp. Fl. Afr. v. p. 132.

Pungo Andongo.—A shrubby lofty climber, ultimately pendent, stems cylindrical, nodose, hard woody at the base, and ¾ in. thick. Flowers fugacious, violet to purple, or bluish. Fruit a depressed triangular capsule, covered with bristly tubercles, 1 to 1½ in. across, containing three one-seeded loculi, dehiscing by valves. Seeds subspherical, brown, the size of a hazel-nut. Leaves papery-rigidulous, glaucous-green when alive, elliptic-ovate or oblong-ovate, with an obtuse or subcordate base, and an acuminate or cuspidate apex, the larger ¾ ft. long, ¼ ft. broad. Somewhat rare in the primitive woods of Mutollo at 2500 and 3000 ft., and on the præsidium itself at Barrancos de Catete and de Pedra Songue. In fl. Jan. in fr. April 1857. No. **6441**. Primitive woods of Sobato Galanga, in fl. and fr. Feb. 1855 ; and Quilombo-Quiacatubia. No. **6441***b*, and Coll. Carp. 990. Cungulungulo, Coll. Carp. 988, 989. Without further locality. Coll. Carp. 994.

9. **PHRYNIUM** Willd. ; Benth. & Hook. f. Gen. Pl. iii. p. 652.

1. **P. textile** Ridl. in Journ. Bot. 1887, p. 133.
*Phyllodes textile* Durand & Schinz, Consp. Fl. Afr. v. p. 133.

Golungo Alto.—A rather fine herb 5 to 6 ft. high ; stems erect, hard, almost woody, petioles very long and rigid. Inflorescence red to scarlet. Native name "Subigrande" ; (*subi*=a textile plant). Plentiful near the rivers in the primitive woods of Quisuculo growing mixed with another species also called "Subi" by the blacks. [Presumably *Clinogyne purpurea* Ridl.] In scarcely op[illegible]ed fl. Sept. 1855. No. **6439**.

### Tribe III. *CANNEÆ*.

10. **CANNA** L.; Benth. & Hook. f. Gen. Pl. iii. p. 654.

1. **C. orientalis** Rosc. Scit. t. 12 (1828); Baker in Gard. Chron. xiii. (1893), p. 43.

*C. indica* L. Sp. Pl. (1753) 1 (pro parte); Ridl. in Journ. Bot. 1887, p. 134; Durand & Schinz, Consp. Fl. Afr. v. p. 134.

Golungo Alto.—Flowers deep scarlet; a herb 5 to 6 ft. with leaves deep green, shining above, not glaucous. Plentiful in reedy places near streams, and in damp shady woods, almost always growing with a species of *Costus*. Banks of river Cuango, Oct. 1854, and in fr. March 1855. Quilombo, July 1856. Banks of Camballa, March 1855. No. **6448**. Plentiful on the præsidium near streams, even forming thick handsome little woods 5 to 7 ft. high. In fl. March 1857. No. **6448***b*. An extremely social *Canna*, ubiquitous in damp places, stem 4 to 8 ft. high, flower scarlet. Sange; wooded places on the river Coango. June 1857. Coll. Carp. 993.

### Tribe IV. *MUSEÆ*.

11. **MUSA** L.; Benth. & Hook. f. Gen. Pl. iii. p. 655.

1. **M. sapientum** L. Syst. ed. x. p. 1303 (1759).

Var. **sanguinea** Welw. ex Ridl. in Journ. Bot. 1887, p. 134; Baker in Annals of Botany vii. p. 212 (1893); Durand & Schinz, Consp. Fl. Afr. v. p. 136.

Golungo Alto.—Stem 5 to 8 ft. high, 3 to 4 in. in diam., cylindrical, lurid green, variegated all over especially at the base with blood-red marks and streaks. Leaves oblong-linear, 4 to 6 ft. long, $\frac{1}{2}$ to 1 ft. broad, apex subobtuse mucronate, a deep blood-red above, pale purplish beneath with a whitish bloom, midrib greenish. Flowers not seen. A fine plant, cultivated in gardens and round Mandioca fields near Sange, plentiful at Ponte de Luiz Simões, where leaves were picked April 1856. Resembles on the whole the cultivated *M. paradisiaca*, but is somewhat smaller in all its dimensions. In April 1856 several large Mandioca fields were seen near Ponte de Luiz Simões, enclosed with this magnificent plant; all the individuals were however barren. The fruits were said to have the same deep purple colour. Nobody knew where the plant came from; those at Golungo Alto were introduced from Cazengo. No. **6446**.

Cazengo.—Called by the Portuguese *Bananeira roxa*. Stem, leaves and fruit tinged with a deep blood-purple colour; leaves glaucous-purplish beneath. Cultivated in rather damp places round houses. In leaf June 1855. No. **6446***b*.

2. **M. ventricosa** Welw. Apont. p. 545 and p. 587 No. 45 (1859); Ridl., *l.c.*; Baker, *l.c.*, p. 206; Durand & Schinz, *l.c.*, p. 136.

Pungo Andongo.—Plant 8 to 10 ft. high, bulb 4 ft. in diameter. Flowers polygamo-dicœcious; lip entire not trifid. Leaf-stalks swollen and spongy at the base, in the adult plant $1\frac{1}{2}$ and even 3 ft. broad, $2\frac{1}{2}$ in. thick, gradually narrowed upwards and thinner, and thus forming the bulbous base of the trunk. Bracts persistent, enveloping the fruit. Rather plentiful in damp rocky places on the præsidium, rarely fruiting. In flower, fruit and leaf May 1857, seen in flower as early as

Jan. 1857. No. **6447**. Under the gigantic spike are 5 to 6 lanceolate sterile bracts. The leaves are generally more linear-elliptic than in *M. sapientum*, also much thicker and stiffer, and with much thicker whitish rose-coloured middle nerves; they also stand more erect on the stem and are not so easily split into many laciniæ as those of the cultivated *Musa*. The stem is more or less ventricose a little above-ground in all older specimens. It is the Adansonia of Scitamineæ. Fruit almost entirely filled with black seeds mixed with a very little pulp and by no means edible. In damp rocky places, especially by streams and cataracts near Pungo Andongo. Coll. Carp. 995.

A specimen consisting only of leaves probably belongs to this order. No. **7228**. No information.

## V. BROMELIACEÆ.

1. **ANANAS** Adans.; Benth. & Hook. f. Gen. Pl. iii. p. 662.

1. **A. sativus** Schult. f. in Roem. & Schult. Syst. vii. p. 1283 (1830); Baker Handb. Bromel. p. 22; Mez in DC. Mon. Phan. ix. p. 164.

Golungo Alto.—A perennial herb with a monocarpic stem; leaves 4 to 6 ft., curved and spreading with a spiny margin, and affording very tough textile fibres. Spontaneous but not indigenous, and plentiful in woods and secondary thickets; also plentifully cultivated everywhere for its fruit. Sange; Aug. 1856. No. **4007**. See Apont. p. 544.

## VI. HÆMODORACEÆ.

1. **SANSEVIERIA** Thunb.; Benth. & Hook. f. Gen. Pl. iii. p. 679.

1. **S. bracteata** Baker in Trans. Linn. Soc. ser. 2. i. p. 253 (1878).

Icolo e Bengo and Loanda.—A perennial acaulescent herb with a very thick root or rather rhizome, horizontal or more or less obliquely descending, hard and woody, white inside, orange-vermilion outside leaves all radical, lanceolate, erect, very thick, very rigid, obtusely canaliculate, glaucous, spotted with white and green, margin red, cartilaginous; scape erect, 1½ to 2 ft., shortly racemose, apex comose, flowers white. Plentiful almost everywhere from Quicuxe to Mutollo and towards Funda, but very rarely flowering. In fl. beginning of June 1854. No. **3750**.

Pungo Andongo.—Leaves very rigid, green, white-spotted, red-margined; flowers white. In rather dry rocky lofty places of the præsidium, towards the south, but rarely flowering although not unplentiful. In fl. Jan. 1857. No. **3751**.

Very near *S. longiflora* Sims.

2. **S. angolensis** Welw. ex Hook. in Rep. Paris. Exhib. 1855 Pt. iii. p. 146 (1856).

*S. cylindrica* Bojer Hort. Maur. (1837) 349 (nomen nudum); Hook. Bot. Mag. t. 5093 (1859); Baker in Journ. Linn. Soc. xiv. p. 549; Durand & Schinz, Consp. Fl. Afr. v. p. 140.

Loanda.—Native name "Ifi"; used for making ropes. A perennial herb with a thick woody root, and erect and runciform almost cylindrical

leaves about 1 in. in diameter, becoming subulate-acuminate towards the apex and almost hard and woody, densely fibrous, glaucous-green, transversely white-spotted ; scapes radical, flowers in a dense long raceme, white-reddish, very sweet-smelling. Very plentiful on sunny hills, from Loanda to Cacuaco and elsewhere. In fl. March 1854. No. **3749**. 1 Dec. 1853, and Nov. 1858. Coll. Carp. 140.

## VII. IRIDEÆ.

### 1. **MORÆA** L. ; Benth & Hook. f. Gen. Pl. iii. p. 688.

1. **M. gracilis** Baker in Journ. Linn. Soc. xvi. p. 130 (1877) (nomen), in Trans. Linn. Soc. ser. 2. i. p. 272 (1878), Handb. Irid. p. 51; Klatt in Durand & Schinz Consp. Fl. Afr. v. p. 150.

Huilla.—Flowers yellow, very fugacious. Plentiful in sandy short thicket-grown pastures from Ferrão da Sola to Jâu and near Lopollo. In fl. and fr. Dec. 1859 to end of March 1860. No. **1545**.

2. **M. textilis** Baker in Journ. Linn. Soc., *l.c.* (nomen), in Trans. Linn. Soc., *l.c.*, p. 270, Handb. Irid. p. 52 ; Klatt, *l.c.*, p. 153.

*Iridopsis textilis* Welw. ex Baker in Trans. Linn. Soc., *l.c.*

Huilla.—Habit of *Iris* but distinguished by its almost 6-phyllous perianth, with inner segments biauriculate at base and subpanduriform, and filaments connate in a long tube including the style. Used for baskets and rope. Soboliferous ; 6 to 10 bulbs frequently found closely united and all cauliferous. Stem 3 to 5 ft., erect, cylindrical, lurid-purple, bearing a little above the base the single leaf, and above acuminate subinflated sheaths, similar to the flowering spathes in form, green-purple colour, and subglaucous pruinose character. Leaf linear, containing very strong fibres, far exceeding the culm, 5 to 8 ft., laxly decumbent among the herbage. Culm 2- to 5-flowered. Flowers of *Iris palustris*, but larger, and a deeper violet-blue, with a longer-stalked ovary. Perianth-tube very short almost none, limbs spathulate, outer reflexed at the tip, and there dark purple, broadly banded with orange towards the inner face opposite the stamens ; inner limbs violet with purple veins, a little broader than the outer, erect. Plentiful in marshy places and damp hillsides near the river of Lopollo, sometimes even in dry places. In fl. April, in fr. May, 1860. No. **1549**.

3. **M. Welwitschii** Baker in Journ. Linn. Soc., *l.c.* (nomen), in Trans. Linn. Soc., *l.c.*, Handb. Irid. p. 51 ; Klatt, *l.c.*

*Iridopsis* sp. Welw. ms. in Herb.

Huilla.—A plentiful herb in swampy places (inundated in the rainy season), by streams near Lopollo. Exactly resembling certain European Irises. Flowers blue-violet. October to December ; in fl. Nov. 1859, in fr. Jan. 1860. No. **1548**. Dec. 1859. Coll. Carp. 12.

4. **M. spithamea** Baker in Journ. Linn. Soc., *l.c.*, p. 131 (nomen), in Trans. Linn. Soc., *l.c.*, p. 271, Handb. Irid. p. 55 ; Klatt, *l.c.*

Huilla.—Perianth-segments campanulately connivent, limb spreading, yellow, marked inside with small black spots from the middle to the base, tips erose-fimbriate, becoming inrolled when marcescent. Stigmas lunately horned. Flowers fugacious. In sandy rather dry thickets about Lopollo and Humpata. In fl. and fr. Oct. 1859. No. **1547**.

2. **FERRARIA** L.; Benth. & Hook. f. Gen. Pl. iii. p. 692.

1. **F. Candelabrum.**

*Morœa Candelabrum* Baker in Journ. Linn. Soc., xvi. p. 131 (nomen), in Trans. Linn. Soc., ser. 2 i. p. 271, Handb. Irid. p. 54; Klatt in Durand & Schinz Consp. Fl. Afr. v. p. 148.

Huilla.—Rather rare among shrubs in rocky places, at 5200 ft. on Morro de Lopollo. Flowers yellow. April 1860. No. **1544**.

2. **F. andongensis.**

*Morœa andongensis* Baker in Journ. Linn. Soc., *l.c.* (nomen), in Trans. Linn. Soc., *l.c.*, Handb. Irid. p. 55; Klatt, *l.c.*, p. 147.

Pungo Andongo.—Bulbo-tuberous, tubers closely crowded, hard. Flowers dull sulphur-coloured, almost of *Ferraria*. In damp short-grassed wooded meadows along with Xyrideæ and *Scleria* at Mutollo near Pedras de Guinga. In fl. Jan., in fr. March 1857. No. **1532**.

3. **F. glutinosa.**

*Morœa glutinosa* Baker in Journ. Linn. Soc., *l.c.* (nomen), in Trans. Linn. Soc., *l.c.*, Handb. Irid., *l.c.*; Klatt, *l.c.*, p. 150.

Huilla.—Flowers darkish purple. Sporadic on hills covered with short bush along with species of *Clematis*, *Tinnea*, etc., near Lopollo (Ferrão da Sola). Feb. and April 1860. No. **1543**.

4. **F. Welwitschii** Baker Handb. Irid. p. 74; Klatt, *l.c.*, p. 157.

Angola.—Known only from a drawing now at Kew.

3. **ARISTEA** Ait.; Benth. & Hook. f. Gen. Pl. iii. p. 701.

1. **A. angolensis** Baker in Journ. Linn. Soc. xvi. p. 111 (nomen), in Trans. Linn. Soc. ser. 2. i. p. 270, Handb. Irid. p. 141; Klatt in Durand & Schinz, Consp. Fl. Afr. v. p. 169.

Huilla.—Flowers violet-blue. In meadows covered with tall herbage, flooded in the rains, near the banks of the river of Lopollo. In fl. and fr. Feb. to May 1860. No. **1550**.

4. **LAPEYROUSIA** Pourr.; Benth. & Hook. f. Gen. Pl. iii. p. 705.

1. **L. Welwitschii** Baker Handb. Irid. p. 168 (1892); Klatt in Durand & Schinz, Consp. Fl. Afr. v. p. 192.

*L. abyssinica* Baker in Trans. Linn. Soc. ser. 2. i. p. 272.

Pungo Andongo.—A small herb, herbaceous-green with intensely blue flowers. Perianth-limb 6-fid, lobes sub-bilabiate spreading, the three lower forming the lower lip with purple and white spots at the base. Plentiful in rather damp pastures covered with short grass near Catete on the præsidium; growing along with *Indigofera*, etc. In fl. and sparsely fruiting Jan. 1857. No. **1531**.

2. **L. littoralis** Baker in Journ. Linn. Soc. xvi. p. 156 (nomen), in Trans. Linn. Soc., *l.c.*, Handb. Irid. p. 172; Klatt, *l.c.*, p. 191.

Mossamedes.—A small herb 3 in. high, with spreading branches. On low gravelly hills near the sea at Praia da Amelia near Villa de Mossamedes. With a few perished fruits July 1859. No. **1546**.

Bulbs were collected but lost in the Monanensian war.

3. **L. cyanescens** Baker in Journ. Linn. Soc., *l.c.* (nomen), in Trans. Linn. Soc., *l.c.*, Handb. Irid., *l.c.*; Klatt, *l.c.*, p. 190.

*Psilosiphon cyanescens* Welw. ex Baker in Journ. Linn. Soc., *l.c.*

Huilla.—Flowers milk-white, soon becoming bluish-violet, especially on the tube and back of the lobes, very elegant and having a very sweet smell especially in the evening. In high boggy places near streams in the Serra de Oiahoia near Humpata. In fl. and fr. April 1860. No. **1553**. Rocky places near Lopollo, March 1860. Coll. Carp. 61.

4. **L. fragrans** Baker in Journ. Linn. Soc., *l.c.* (nomen), in Trans. Linn. Soc., *l.c.*, Handb. Irid., *l.c.*; Klatt, *l.c.*, p. 191.

*Psilosiphon fragrans* Welw. ex Baker in Journ. Linn. Soc., *l.c.*

Huilla.—An erect herb 1 ft. high, stem leafy from the middle, leaves linear, erect, coriaceous, rigidulous. Corolla white, becoming violet in drying, tube long, lobes campanulate, erect, linear, rather obtuse, peduncles rigid, widely ascending. Plentiful but rarely flowering in stony and rocky sunny places near Lopollo. In fl. in the middle of Dec. 1859. No. **1552**.

Scarcely separable from the last species.

5. **L. odoratissima** Baker in Journ. Linn. Soc., *l.c.* (nomen), in Trans. Linn. Soc., *l.c.*, p. 273, t. 36, figs. 2 & 3, Handb. Irid. p. 173; Klatt, *l.c.*

*Psilosiphon odoratissima* Welw. ex Baker in Journ. Linn. Soc., *l.c.*

Huilla.—An erect herb scarcely 1 ft. high, with a conical bulb, clothed with reddish-brown closely reticulate tunics, base broadly truncate, margin broken into fibrils, stem naked below, then distichously leaved; leaves deeply grooved, at first sheathing the flowers; corolla with a long tube, lobes lanceolate, acuminate, up to time of opening campanulately erect; corolla completely white, smell very pleasant. Plentiful in sandy rocky thickets near Lopollo. In fl. 11 Dec. 1859. No. **1551**.

5. **GLADIOLUS** L.; Benth. & Hook. f. Gen. Pl. iii. p. 709.

1. **G. gregarius** Welw. ex Baker in Journ. Linn. Soc. xvi. p. 174 (nomen), in Trans. Linn. Soc. ser. 2. i. p. 268, Handb. Irid. p. 210; Klatt in Durand & Schinz, Consp. Fl. Afr. v. p. 218.

Pungo Andongo.—Growing cæspitosely with 4 to 10 bulbs closely crowded; flowers milk-white, with two small violet spots on the inside of the lip. Plentiful in rather lofty rocky places of the Serra de Pedras de Guinga. In fl. Jan. and March 1857. No. **1528**.

2. **G. laxiflorus** Baker in Journ. Linn. Soc., *l.c.* (nomen), in Trans. Linn. Soc., *l.c.*, Handb. Irid. p. 211; Klatt, *l.c.*, p. 219.

Huilla.—Flowers a very bright rose-purple. Very plentiful in marshy deep-grassed meadows, especially round ponds near the river of Lopollo. In fl. and fr. Dec. 1859. No. **1536**.

3. **G. brevicaulis** Baker in Journ. Linn. Soc., *l.c.* (nomen), in Trans. Linn. Soc., *l.c.*, p. 267, Handb. Irid., *l.c.*; Klatt, *l.c.*, p. 244.

Huilla.—Tunics of corm densely reticulate, stem simple, clothed with short long-sheathing leaves, radical leaves very narrow, appearing late, perianth violet-purple, three lower lobes obcuneate, discs white with a central deep purple lance-shaped mark. Plentiful in rather damp sandy short-grassed meadows and pastures, between Lopollo and Humpata. In fl. Dec. 1859 and Jan. 1860. No. **1534**.

4. **G. luridus** Welw. ex Baker in Journ. Linn. Soc., *l.c.* (nomen), in Trans. Linn. Soc., *l.c.*, Handb. Irid., *l.c.* ; Klatt, *l.c.*, p. 220.

Huilla.—Two feet high with the habit of *G. imbricatus*. Colour of flowers exactly as in *Iris lurida*. Plentiful in fields subjected to cultivation three years before, now planted with *Zea Mays* ; near Lopollo Dec. 1859. No. **1533**.

5. **G. cærulescens** Baker in Journ. Linn. Soc., *l.c.* (nomen), in Trans. Linn. Soc., *l.c.*, Handb. Irid., *l.c.* ; Klatt, *l.c.*, p. 215.

Huilla.—Flowers dull bluish. Sporadic in cultivated fields formerly covered with woody thickets near Lopollo. A few specimens seen in fl. April 1860. No. **1537**.

6. **G. Quartinianus** Rich. Tent. Fl. Abyss. ii. p. 306 (1851) ; Baker in Trans. Linn. Soc., *l.c.*, p. 269, Handb. Irid. p. 213 ; Klatt, *l.c.*, p. 223.

Huilla.—Often 4 ft. high. Flowers with numerous small orange-yellow and red spots. Sporadic in deeply herb-grown wooded meadows of Monino between Lopollo and Lake Ivantâla. In fl. Dec 1859. No. **1535**.

7. **G. angolensis** Welw. ex Baker in Journ. Linn. Soc., *l.c.*, p. 176 (nomen), in Trans. Linn. Soc., *l.c.*, Handb. Irid., *l.c.* ; Klatt, *l.c.*, p. 213.

Golungo Alto.—A gigantic species, 4 to 6, sometimes even 7 to 7½ ft. high. Flowers very beautiful, yellow with numerous closely set orange and scarlet lines and spots ; outer perianth-lobes suffused with red towards the base. On grassy thicket-clad slopes of the Serra de Alta Queta above N-delle and near Sange, growing among grasses, *Andropogon* and Marianga (*Pennisetum* sp.) 12 to 18 ft. high. In fl. Feb., in fr. March 1856. Nos. **1527** and **1527***b*. Coll. Carp. 1000. Canaulo, April 1856. Coll. Carp. 1001.

Pungo Andongo.—Strictly erect, 3½ to 6 ft. high. One of the most beautiful of its genus. Plentiful in dry and rather damp grassy places near Muta Lucala on the river Cuanza. In fl. March 1857. No. **1530**.

8. **G. Welwitschii** Baker in Journ. Linn. Soc., *l.c.*, p. 175 (nomen), in Trans. Linn. Soc., *l.c.*, p. 268, Handb. Irid., *l.c.* ; Klatt, *l.c.*, p. 227.

*G. splendens* Welw. ex Baker in Trans. Linn. Soc., *l.c.* (non Baker).

Huilla.—Flowers very fine, variegated with orange-red. On sandy thicket-grown hillsides with clay subsoil round Lopollo. In fl. Oct. and Nov. 1859, and again sporadically May 1860. No. **1541**.

9. **G. benguellensis** Baker in Journ. Linn. Soc., *l.c.*, p. 174 (nomen), in Trans. Linn. Soc., *l.c.*, Handb. Irid. p. 221 ; Klatt, *l.c.*, p. 213.

Huilla.—Flowers with orange and purple spots. Somewhat plentiful in rather dry thicket-grown pastures near Lopollo. Dec. 1859, Feb. 1860. No. **1540**.

10. **G. multiflorus** Baker in Journ. Linn. Soc., *l.c.*, p. 175 (nomen), in Trans. Linn. Soc., *l.c.*, p. 269, Handb. Irid., *l.c.* ; Klatt, *l.c.*, p. 221.

Huilla.—Spike pale purple; flowers purple-spotted, upper lip dark violet-purple, under lip white. In fl. and fr. Dec. 1859 and Feb. 1860. No. **1538**.

11. **G. andongensis** Welw. ex Baker in Journ. Linn. Soc., *l.c.*, p. 176 (nomen), in Trans. Linn. Soc., *l.c.*, Handb. Irid., *l.c.*; Klatt, *l.c.*, p. 212.

Pungo Andongo.—1 to 1½ ft. high, with somewhat curved apex; flowers orange-yellow with small dark red spots; leaves rigid falcately curved, many-nerved, median nerve nearer to one side. Grows sparsely on the higher rocks of the præsidium, in a place called Pedra Songue. 13 Dec. 1856. No. **1529**.

The following numbers comprise material insufficient for specific determination:—

Huilla.—Flowers large, vermilion-scarlet, secund, leaves linear-lanceolate, appearing later. Plentiful in dry thickets near Huilla. In fl. Oct., in fr. Nov. 1859. Coll. Carp. 72. The specimen consists only of a single capsule and seeds, and is apparently closely allied to *G. Welwitschii* Baker, from which however Welwitsch separated it as a new and distinct species.

Huilla.—Flowers scarlet; leaves appearing later. Plentiful in sandy pastures near Lopollo. In fl. Oct. to Feb. Jan. 1860. Coll. Carp. 1002.

Perhaps near *G. Welwitschii* Baker.

Huilla.—Feb. 1860. Coll. Carp. 1003.

Huilla.—A single specimen in fruit. In sandy rocky wooded places near Mumpulla. Oct. 1859. No. **1542**.

6. **ANTHOLYZA** L.; Benth. & Hook. fil. Gen. Pl. iii. p. 710.

1. **A. huillensis** Welw. ex Baker in Journ. Linn. Soc. xvi. p. 179 (nomen), in Trans. Linn. Soc. ser. 2, i. p. 270, Handb. Irid. p. 232.

*Anisanthus huillensis* Klatt in Abh. Naturf. Ges. Halle xv. p. 344 (1882), and in Durand & Schinz, Consp. Fl. Afr. v. p. 228.

Huilla.—An erect herb 1 ft. high, leaves narrow, flowers a splendid scarlet. About 5000 ft. above sea-level in sunny sandy-stony thicket-grown places around Lopollo and Humpata; not by any means rare. In fl. and sparse fr. Nov. and Dec. 1859. No. **1539**.

Owing to lack of sufficient material the position of the following number is very doubtful:—

Bumbo.—Damp woods of Serra da Xella above Bumbo. Oct. 1859. No. **1554**. A perennial herb with the habit almost of *Iris*, leaves leathery, distichously sheathing. Flowers not seen. Serra da Xella and near Mumpulla. Oct. 1859. Coll. Carp. 1048.

## VIII. AMARYLLIDEÆ.

1. **HYPOXIS** L.; Benth. & Hook. f. Gen. Pl. iii. p. 717.

1. **H. monanthos** Baker in Trans. Linn. Soc. ser. 2, i. p. 266 (1878), in Journ. Linn. Soc. xvii. p. 108; Durand & Schinz Consp. Fl. Afr. v. p. 233.

Huilla.—On the shortly-grassed margins of the stream of Lopollo

(in Morro de Lopollo), along with *Cyathea arborescens*. A few specimens found in Dec. 1859, but afterwards sought in vain. No. **4058**.

2. **H. canaliculata** Baker in Trans. Linn. Soc., *l.c.*, p. 265, in Journ. Linn. Soc., *l.c.*, p. 109; Durand & Schinz, *l.c*, p. 231.

Huilla.—Plentiful on sandy hill-pastures near Lopollo. Dec. 1859 and Jan. 1860. No. **4057**.

3. **H. cuanzensis** Welw. ex Baker in Trans. Linn. Soc., *l.c.*, in Journ. Linn. Soc., *l.c.*, p. 111; Durand & Schinz, *l.c.*

Pungo Andongo.—Tuber large compact. Flowers bright yellow; leaves erect to patulous, coriaceous, subfleshy. Plentiful in damp meadows between Quiconde and Calemba Island. In fl. and fr. March 1857. No. **4056**.

4. **H. angustifolia** Lam. Encyc. iii. p. 182; Baker in Trans. Linn. Soc., *l.c.*, in Journ. Linn. Soc., *l.c.*; Durand & Schinz, *l.c.*

Pungo Andongo.—Plentiful, but in few places, in rich damp pastures of the præsidium near Catete. In fl. and fr., beginning of Dec. 1856. No. **4053**. In sandy pastures between Quiconde and Condo, in fl. middle of March 1857. No. **4054**.

Huilla.—Sparsely in sandy places bearing short herbage, near Ferrão da Sola. Nov. 1859. No. **4055**.

5. **H. polystachya** Welw. ex Baker in Trans. Linn. Soc., *l.c.*, p. 266, in Journ. Linn. Soc., *l.c.*, p. 115; Durand & Schinz, *l.c.*, p. 233.

Huilla.—Corm ovate to subspherical, densely fleshy, 2 to 6 in. in diameter, sometimes as big as a child's head. Plant somewhat rarely flowering, at any rate in this district; numerous individuals were seen but very few in flower. Flowers yellow, rapidly becoming black. Loculi of capsule 1-seeded, but two of them often empty, the whole fruit sometimes containing a single spherical, black, minutely granulate, and rostellate seed; dehiscence circumscissile the upper part coming away together with the withered perianth-segments. On thicket-grown hillsides between Lopollo and Catumba. In fl. and fr. Dec. 1859. No. **4060**.

Var. **andongensis** Baker in Trans. Linn. Soc., *l.c.*, in Journ. Linn. Soc., *l.c.*; Durand & Schinz, *l.c.*

Pungo Andongo.—An acaulescent herb; corm dense as big as a fist or larger; leaves trifarious, arcuately spreading, rigid, coriaceous. Flowers on a flattened peduncle. In damp sandy meadows on the banks of the river Cuanza. In fr. March 1857. No. **4061**.

6. **H. angolensis** Baker in Trans. Linn. Soc., *l.c.*, Journ. Linn. Soc., *l.c.*, p. 116; Durand & Schinz, *l.c.*, p. 231.

Huilla.—Plentiful on short thicket-grown sandy hills, with clayey subsoil near Lopollo. Flowers fine, yellow. Oct. and Nov. 1859, and again sporadically in May 1860. No. **4059**.

2. **CURCULIGO** Gaertn.; Benth. & Hook. f. Gen. Pl. iii. p. 717.

1. **C. gallabatensis** Schweinf. ex Baker in Trans. Linn. Soc. ser. 2, i. p. 266 (1878), in Journ. Linn. Soc. xvii. p. 123; Durand & Schinz, Consp. Fl. Afr. v. p. 236.

Golungo Alto.—Seems to be *Gethyllis pilosa* Schum. & Thonn. A spring herb, with tuberous root, tuber vertical, thick fleshy farinaceous,

bearing numerous fibres. Outer perianth-segments pale yellowish, inner more petaloid, intense yellow but soon becoming pale. Anthers large, yellow. Rather rare in the grassy edges of thickets on the hills of Queta, along with *Gladiolus angolensis*. In fl. and fr. end of Nov. 1855. No. **4062**.

3. **CRYPTOSTEPHANUS** Welw. ex Baker ; Benth. & Hook. f. Gen. Pl. iii. p. 718.

1. **C. densiflorus** Welw. ex Baker in Journ. Bot. 1878, p. 193 t. 197, Handb. Amaryllid. p. 1 ; Durand & Schinz, *l.c.*, p. 239.

Huilla.—Sporadic in thicket-grown places on sandy soil exposed to the sun near Lopollo. In fl. Oct. and Nov. 1859. In fr. Jan. 1860. No. **4027**.

4. **HIPPEASTRUM** Herb. ; Benth. & Hook. f. Gen. Pl. iii. p. 724.

1. **H. Reginæ** Herb. App. p. 31 (1821); Baker Handb. Amaryllid. p. 48.

*H. africanum* Welw. ex Baker, *l.c.*, p. 49.

Prince's Island.—Bulb-scales thin, white with vermilion spots. In very thick shady primitive woods 3500 to 4000 ft. high, on the Pico de Papagaio. In fl. Sept. 1853. Seems thoroughly spontaneous and even indigenous ; not cultivated anywhere in the island and not seen in the less elevated districts. No. **4023**.

5. **CRINUM** L. ; Benth. & Hook. f. Gen. Pl. iii. p. 726.

1. **C. Welwitschii** Baker in Gard. Chron. xvi. (1881, p. 40), Handb. Amaryllid. p. 78 ; Durand & Schinz, Consp. Fl. Afr. v. p. 252.

Mossamedes.—Bulb as big as a child's head, ovate-spherical. Scape 1 ft., subascending, compressed almost two-edged, firm. Umbel many-flowered, flowers long-tubed, capsules depressed-spherical, more or less angled, bulbiferous. Rare in sandy places on the river Bero. Specimen almost entirely perished. July 1859. No. **4016**.

Described from a very incomplete specimen.

2. **C. buphanoides** Welw. ex Baker in Journ. Bot. 1878, p. 195, Handb. Amaryllid. p. 80 ; Durand & Schinz, *l.c.*, p. 247.

Pungo Andongo.—Bulb very large, often as big as a child's head, laxly tunicate ; leaves large, broadly lanceolate-linear, long acuminate, coriaceous, glaucous. Flowers to 30 or 40 on the same scape, white with crimson bands. In sandy woods at Cazella and on the præsidium ; plentiful from the stream Lutete as far as Pungo Andongo. In fl. 18 Oct. 1856. No. **4014**.

3. **C. latifolium** L. Sp. Pl. p. 291 (1753); Baker Handb. Amaryllid. p. 87.

Pungo Andongo.—Plentiful in sandy woods between the river Lutete and Pungo Andongo. Bulbs collected in this place flowered in the Lumiar garden near Lisbon, beginning of Sept. 1863, exactly at the same time as in South Africa. No. **4017**.

Huilla.—Leaves contemporary with the flowers. Flowers white marked with reddish violet, very beautiful. Here and there in wooded thickets near Lopollo (also near Mossamedes). In fl. Nov. 1859 No. **4015**.

The leaf is 4¼ in. broad just above the broadly rounded base. Put doubtfully under *C. yuccæflorum* Salisb. by Baker, *l.c.*, p. 90, followed by Durand & Schinz, *l.c.*, p. 251.

4. **C. fimbriatulum** Baker in Journ. Bot. 1878, p. 196 ; Handb. Amaryllid. p. 90 ; Durand & Schinz, *l.c.*, p. 248.

Loanda.—Leaves 2 to 5 ft., fleshy, glaucous-green, striated, roundly-grooved, very long acuminate, sometimes preceding, sometimes contemporaneous with the flowers. Scape 2 ft., 3- to 7-flowered, flowers beautiful white with rose-coloured bands, sweet-smelling. In meadows flooded in the summer-time ; almost throughout the whole district. Museque de Senhor Ricardo S. Rejo, Quicuxe. In fl. March 1854. No. **4018**.

Ponta d'Ambriz.—Growing with *Flagellaria indica* Nov. 1853. No. **4019**.

Scarcely distinguishable from *C. scabrum* Herb.

5. **C. giganteum** Andr. Bot. Rep. t. 169 (1804) ; Baker Handb. Amaryllid. p. 91 ; Durand & Schinz, *l.c.*

*C. vanillodorum* Welw. ex Baker in Journ. Bot., *l.c.*

Golungo Alto.—Bulb when young spherical, then columnar, as big as a child's head, scales dark-coloured ; leaves linear-lanceolate, 2 to 3 ft., margin originally undulate near the base, very obtusely carinate, shining, very juicy, and widely spreading. Scape 2 to 4 ft. angular-compressed, subglaucous green, solid. Flowers 3 to 6 in the umbel, tube 4 in. to a span, long slender, limb shaped like a tulip. Well worth cultivating. Flowers smelling very sweetly and strongly like those of *Vanilla*. Plentiful by the rivers Cuango, Quiapoza, etc. Flowers Oct. to Dec. In boggy places by the river Cuango ; Nov. 1854. Young plants with erect rather thick and rigid smooth leaves shining above darker beneath were collected near the boggy banks of the Quiapoza river near Sange with orchids and a species of *Raphia*. No. **4020**. Bulbs collected in Angola, and flowered in the Lumiar garden in March 1862. No. **4020***b*.

Libongo.—Well developed bulb almost as large as a fist, elongate-conical. Scape compressed at the base, gradually becoming more cylindrical towards the apex. Flowers white or rather snow-white, with a very sweet *Vanilla*-like smell. Rather rare on the marshy banks of the river Lifune in the somewhat elevated woods about ten geographical miles from the sea. In fl. at end of Sept. 1858. No. **4021**.

6. **C. angolense** Benth. & Hook. f. Gen. Pl. iii. p. 730 ; Baker Handb. Amaryllid. p. 80 ; Durand & Schinz, *l.c.*, p. 246.

*Buphane angolensis* Baker in Journ. Bot., *l.c.*, p. 197.

Huilla.—Between *Crinum* and *Hæmanthus*, with almost all the characters of *Hæmanthus*, but has the two-leaved spathe of *Crinum*. Bulb large ovate-spherical. Leaves appearing after the flowers, bifariously sheathing, curved to prostrate, obtuse, serrulate, glaucous. Flowers dull rose-coloured, fragrant. In thicket-grown rather damp pastures near Mumpulla and Lopollo, about 5500 ft. In fl. at end of Oct. 1859 ; in leaf April 1860. No. **4012**.

The following number, consisting only of leaves and the upper portion of the bulb, probably belongs to this species :—

Pungo Andongo.—Bulb the size of a fist, ovate or ovately conical, containing a yellow viscid resinous juice, scales dark-coloured. Leaves

glaucous, thick, coriaceous, curved linear, obtuse. Habit of a *Pancratium*. Flowers not seen. Plentiful on rocks covered with damp sand between Candumba and Mangue, March 1857. No. **4013**.

The following may belong to the genus :—

Talamagongo.—A bulb, found in rather damp places near Casange by Don Pereira and sent to Welwitsch ; produced only leaves when cultivated in his garden at Golungo ; afterwards grown in the Lumiar garden (Lisbon). Leaves gathered in garden at Golungo, June 1856. No. **4022**.

6. **CYRTANTHUS** Ait.; Benth. & Hook. f. Gen. Pl. iii. p. 729.

1. **C. Welwitschii** Hiern ex Baker in Journ. Bot. 1878, p. 197 ; Baker Handb. Amaryllid. p. 55 ; Durand & Schinz, Consp. Fl. Afr. v. p. 262.

Huilla.—Bulbous ; leaves contemporary with the flowers, linear, erect, obtuse, glaucescent, equalling the scape ; flowers brick-red, rather fleshy, patulous, 1 in. long, tube gradually narrowing towards the ovary. Seeds obliquely imbricated, black, winged on one side. The three valves of the capsule ultimately reflexed. Marshy places on banks of streams, along with *Aroides hastatum* and *Typha angustifolia* near Lopollo. In fl. Nov. 1859, in fr. Jan. 1860. No. **4028**. In fr. Jan. 1860. .Coll. Carp. 1005.

7. **HÆMANTHUS** Benth. & Hook. f. Gen. Pl. iii. p. 730.

1. **H. multiflorus** Martyn Icon. cum descript. (1795).

Var. **filiflorus** Rendle.

*H. filiflorus* Hiern ex Baker in Journ. Bot. 1878, p. 194 ; Baker Handb. Amaryllid. p. 63 (very near *H. multiflorus*; perhaps a mere variety) ; Durand & Schinz, Consp. Fl. Afr. v. p. 264.

Differs from the type in its very narrow perianth-segments.

Ambaca.—In thicket-grown places on the red clay between Hâlo and Zamba, Oct. 1857. No. **4010**.

Pungo Andongo.—Bulb ovate-conical, the size of a hen's egg to that of a fist, white, compact ; flowers rose-scarlet, leaves protruding after the flowers, numerous, leathery-fleshy, shining, sheaths very long, closely amplexicaul. Scape 1 to 1½ ft., lateral, green, semicylindrical at the base, somewhat flattened above, considerably dilated below the umbel forming a receptacle bearing 4 reflexed spathe-leaves lanceolate-acuminate from a broad base, and greenish-purple, with 2 or 3 much narrower inner leaflets. Flowers 80 to 100, and even more, a fine blood-red. Pedicels slender terete-compressed, greenish-purple, intermingled with rather long filiform white bracts. Perianth-tube sulcate ⅓ in., lobes linear exceeding the tube, pale rose or reddish, ultimately reflexed. Filaments stiff, erect, blood-red, nearly 1 in. long ; anthers blood-red, pollen yellow. Style blood-red equal to the stamens, apex obsoletely 2- to 3-lobed. Odour faint, of honey. In open thickets and wooded places near Quilongo and Luxillo, in fl. Oct., in fr. and leaf Dec. and Jan. 1857-8. No. **4009**.

2. **H. angolensis** Welw. ex Baker in Journ. Bot., *l.c.* ; Baker Handb. Amaryllid. p. 65 ; Durand & Schinz, *l.c.*, p. 263.

Golungo Alto.—Bulb 4 to 6 years old, elongate-cyliudrical, slightly thickened at the base, where there are numerous long fleshy root-fibres. Leaves appearing after the flowers, closely sheathing, fleshy,

shining, sheaths spotted with purple. Umbel in well-developed plants at first flat, then hemispherical, finally when all the flowers have opened, spherical. Not plentiful in elevated shady primitive woods (*Coffea*), in rather dry stony places, and on the marshy banks of streams at Cungulungulo; in fl. Feb. 1855. In very lofty mountainous places near Montalegre; Jan. and Feb. 1855. No. **4008**.

The following number comprises insufficient material for specific determination :—

Pungo Andongo.—*H. cruentatus* Sch. & Thonn. ? Bulb as big as a rather large nut, or larger, somewhat conical. Leaves 4 to 7, emerging from the bulb almost opposite, lanceolate, wavy, long acuminate, subfleshy, with an obtuse keel; blade with a long decurrent base. In somewhat open woods near Luxillo, without fl. end Jan. 1857. No. **4011**.

8. **BOOPHANE** Herb.; Benth. & Hook. f. Gen. Pl. iii. p. 730.

1. **B. toxicaria** Herb. App. p. 18 (1821).

*Buphane disticha* Herb. sub Bot. Mag. t. 2578 (1825); Baker Handb. Amaryllid. p. 73; Durand & Schinz, Consp. Fl. Afr. v. p. 268.

Pungo Andongo.—A fine plant; bulb large elliptical, scales cartilaginous, orange to brick-red. Leaves arranged fan-like in two rows, glaucous, thick and coriaceous. In *Mimosæ* woods between Guinga and Candamba. Without fl. Jan. 1857. No. **4024**.

Huilla.—A beautiful plant; bulb large ovately-oblong, scales orange-colour, parchment-like, almost crustaceous. Leaves coming after the flowers, 1½ ft. long, linear-lanceolate, rather obtuse, striated, glaucous, coriaceous, rather fleshy, spreading like a fan from the top of the bulb with faces opposed. Scape compressed, about 2 in. Peduncles radiating in a perfect sphere in the fruiting stage, and bearing bulbils. Pastures and less dense grassy thickets between Mumpulla and Lopollo. In fl. Oct. 1859; in leaf and fr. April 1860. No. **4026**. On thicket-grown hills between Lopollo and Nene, in leaf Feb. and April 1860. No. **4025**. Germinating bulbils. Coll. Carp. 1004.

9. **HYMENOCALLIS** Salisb.; Benth. & Hook. f. Gen. Pl. iii. p. 734.

1. **H. littoralis** Salisb. in Trans. Hort. Soc. i. p. 338 (1812).

*H. senegambica* Kth. & Bouché (e descript.); Baker Handb. Amaryllid. p. 124.

Ambriz.—On sandy places near the sea, and in the interior as far as Quizembo and in Marguerito Mossul to the mouth of the river Onco. On sandy sea-shores of the Congo country between Ambriz and Quizembo, but very scattered. Cultivated in Loanda, where it flowered in July and August 1858. Flowered also in the Lumiar garden and in Welwitsch's house at Lisbon in July 1863. No. **4029**.

10. **XEROPHYTA** Juss.

*Vellozia* Vand.; Benth. & Hook. f. Gen. Pl. iii. p. 739.

1. **X. capillaris** Baker in Trans. Linn. Soc. ser. 2. i. p. 264, t. 36, fig. 1 (1878); Durand & Schinz, Consp. Fl. Afr. v. p. 271.

*Vellosia capillaris* Welw. ex Baker, *l.c.*

Huilla.—Stem 2 ft. long. Flowers often milk-white, sometimes

blue. Blooms somewhat rarely, for barren plants were often seen. In rather lofty thickets on the edges of woods at Monino and in the lofty plain of Empalanca. In fl. Feb. 1860. No. **1558**.

2. **X. squarrosa** Baker, *l.c.*; Durand & Schinz, *l.c.*, p. 272.
*Vellosia squarrosa* Welw. ex Baker, *l.c.*

Pungo Andongo.—A shrub, 3 to 4, more rarely 5 ft. high; stem 4 to 6 in. in circumference at the base. Flowers bright or deep blue, more rarely white. Plentiful in the more lofty rocky slopes of the præsidium, growing in thick masses. Dec. 1856. No. **1555**. June 1857. Coll. Carp. 1006.

3. **X. stenophylla** Baker, *l.c.*, p. 265; Durand & Schinz, *l.c.*
*Vellosia stenophylla* Welw. ex Baker, *l.c.*

Mossamedes.—Leaves white papillose on the upper face. Plentiful and in dense clusters on sandy schists near Cazimba between Maiombo and Pomangala. Without fl. Oct. 1859. No. **1557**. Stem of species of *Vellosia* in winter state—*i.e.* July and August. The stems are thickly crowded over wide areas, and send out at the apex a bundle of leaves only after the rains; very rarely flowering. Mountain schists, between Maiombo and Cazimba. Oct. 1859. Coll. Carp. 1007.

4. **X. velutina** Baker, *l.c.*; Durand & Schinz, *l.c.*
*Vellosia velutina* Welw. ex Baker, *l.c.*

Pungo Andongo.—A small erect shrub 1½ to 2½ ft.; flowers blue. Plentiful, but apparently rarely flowering, on the sandy schistose rocks near the bank of the river Cuanza. March 1857. No. **1556**.

## IX. TACCACEÆ.

1. **TACCA** Forst.; Benth. & Hook. f. Gen. Pl. iii. p. 741.

1. **T. pinnatifida** Forst. Char. Gen. Pl. p. 70 (1776), Plant. Esc. p. 59 (1786); Kunth Enum. v. p. 458; Durand & Schinz, Consp. Fl. Afr. v. p. 272.
*T. Quanzensis* Welw. Apont. p. 591, No. 108 (1859).

Pungo Andongo.—Leaf of a plant grown at Loanda from tubers collected March 1857 near Candumba on the river Cuanza. It began to send out leaf and flowers towards the end of October 1858. Petiole very pale green, densely covered with dull violet spots, and obsoletely furrowed, in the cultivated plant a span and a half high, with an amplexicaul base. Own garden Loanda, 28 Oct. 1858. Rather damp sandy thickets on the right of the Cuanza near Cavallo; with ripe fruit 29 Jan. 1857. In flower without leaf; Condo, March 1857. No. **6475**. On the wet banks of the Cuanza near Candumba. March 1857. Coll. Carp. 1008.

## X. DIOSCOREACEÆ.

1. **DIOSCOREA** L.; Benth. & Hook. f. Gen. Pl. iii. p. 742.

*Leaves simple.*

1. **D. Preussii** Pax in Engl. Jahrb. xv. p. 147 (1893); Durand & Schinz, Consp. Fl. Afr. v. p. 275.

Flowers slightly smaller and more hairy than in Preuss' Kamerun plant but not specifically distinct.

Golungo Alto.—A very widely climbing herb, draping and hanging from palms; tubercles often but not always formed in the leaf-axils. In palm woods on the river Quiapoza near Sange. April 1855. No. **4038**.

2. **D. andongensis** Rendle sp. nov.

A herb generally with a woody base, stem broadly winged and furrowed, (in the flower-bearing shoots of which the herbarium specimen consists, the stem is much twisted and furrowed but not winged,) sparsely ferruginously hairy; leaves alternate, exactly cordate with a long apiculus, shorter than the internodes, leaf-stalk generally shorter than the blade, sparsely puberulous, blade 9-nerved, the lowest nerve on each side giving off a strong branch just above its base; lower surface softly densely tomentose on the flowering shoots, very thinly hairy on the single fruit-bearing shoot; male spikes simple, 4 in the axil of each leaf, shorter than the leaf, peduncle, bracts and flower-buds with a short dense ferruginous indumentum; flowers solitary, bracts triangular ovate, almost as long as the flowers, perianth broadly cyathiform, segments subequal, outer ovate blunt, hairy on back, inner ovate-oblong with an obtuse to rounded apex; stamens 6 fertile, subequal, inserted on the base of the perianth-segments, anthers oblong, of the outer twice as long as of the inner, ovary-rudiment conspicuous 6-denticulate; female spike sometimes longer, flowers solitary, sessile, bracts about half the length, ovary linear-oblong, ferruginously hairy, bluntly edged in flowering-stage becoming winged as the perianth withers, perianth-segments subsucculent, with more membranous apex (outer 3) and margin, more or less oblong narrowing at the apex, the inner 3 slightly narrower with a thickened fleshy apex, spotted with red and sparsely hairy except near apex and margins, staminodes 6, cordate, sessile at base of segments, style-column with large recurving stigmas, about half the length of the segments. Unripe fruit oval, with membranous wings.

Leaf-stalks 3 to 5 in. long, blades including apiculus 4 to $7\frac{1}{2}$ in. young male spike 4 in., the female reaching 1 ft.; bracts on male spike $1\frac{1}{2}$ line long, bracteole subulate $\frac{2}{3}$ line, perianth-segments $1\frac{1}{3}$ line, stamens $\frac{4}{5}$ line; ovary 2 to 3 lines long, perianth-segments $1\frac{1}{3}$ to $1\frac{1}{2}$ line, style and stigmas about $\frac{2}{3}$ line. Unripe fruit 2 in. long by half as broad. Near *D. Preussii* Pax, but distinguished by the ferruginous tomentum of leaves and inflorescence, rather narrower perianth-segments, and 6 anther-bearing stamens.

Pungo Andongo.—Flowers greenish. Completely draping the larger trees with its foliage. Plentiful in small woods among the huge rocks between Catete and Luxillo. In fl. middle and end of Jan. 1857. No. **4040**.

3. **D. polyantha** Rendle sp. nov.

A suffruticose high and wide climber, branches densely ferruginously stellato-tomentose, the tomentum disappearing in the older shoots, leaves alternate generally longer than the internodes, long-stalked, petioles shorter than the cordate acute 7-nerved

blade, the petiole and under surface of the leaf similarly hairy to the stem, upper face of leaf glabrescent; a bulbil sometimes occurs in the axil of the uppermost leaves; male spikes simple, in axillary fascicles of 2 to 4, equal to or slightly exceeding the leaves; peduncle, bracts, bracteole, and back of sepals similarly stellately tomentose; flowers solitary, subsessile, bracts small shorter than the flower, ovate-acuminate, bracteole similar but half the size; perianth cyathiform, segments subequal, 3 outer oval to oval-oblong, concave, blunt, 3 inner glabrous, rather broadly oval, blunt, flat, with a fleshy median keel along the upper (inner) face; stamens 6 all fertile, the inner twice the length of the outer; outer 3 short sharply kneed and bent inwards below the anther insertion, anther globose with a short apical dorsal recurving spur, inner 3 suberect with a less prominent dorsal knee below the anther which is only half the size of the outer and has a smaller spur; gynœcium represented by 3 linear-subulate subtriquetrous processes united at the base, and a little shorter than the inner stamens.

Leaf-blades on a flowering branch diminishing upwards from 3 in. to $\frac{3}{4}$ in. in length, and becoming more shallowly cordate, the petioles from $2\frac{1}{2}$ to $\frac{1}{4}$ in.; male spikes 6 in. or shorter; flowers a little over 1 line long, whitish, slightly fragrant, bracts $\frac{4}{5}$ line; perianth-segments scarcely $1\frac{1}{2}$ line long, outer stamens $\frac{1}{5}$ line, inner $\frac{2}{3}$ line, carpel rudiments $\frac{1}{2}$ line.

Near *D. hirtiflora* Benth. (of the Niger region), from which it differs in its ferruginous indumentum, and the fertility of both whorls of stamens, as well as in other points of floral structure.

Golungo Alto.—Woody thickets Monte de Queta above N-delle, but rare. In fl. April 1856. No. **4039**.

The following specimen consisting of leaves only probably belongs here:—

Ambaca.—A climber with the habit of *Dioscorea*; one specimen only was found and without flower. In woods of Araliaceæ near the river Lucala; Oct. 1856. No. **4034**.

4. **D. sativa** L. Sp. Pl. p. 1033 (1753); Welw. Apont. p. 543; Durand & Schinz, *l.c.*

*D. bulbifera* L., *l.c.* *Helmia bulbifera* Kth. Enum. v. p. 435 (1850).

Golungo Alto.—Suffruticose rarely shrubby, stems 10 to 20 ft. long, cord-like, very high climbing, then hanging, bulbiferous. On palms (*Elæis*, *Raphia*) and other trees by the banks of the Delambou. In fl. and fr. April 1856. No. **4037**. The following number in Coll. Carp. may belong to this species. Aërial axillary tubercles of some *Dioscorea*. Thrown up in the woods of Golungo Alto by the river Quiporo. July 1856. 1012.

Cazengo.—Openings of woods near the sweet springs, almost destroyed by cattle. Jan. 1855. No. **4033**.

Loanda.—Leaves only. No. **4031**.

Bengo.—A lofty climbing herb with edible tubers and bulbils in the leaf-axils. Woods on the river Bengo near S. Antonio. Without fl. Jan. 1854. No. **4032**.

5. **D. angustiflora** Rendle sp. nov.

Stem and branches subcompressed not winged, internodes glabrous with a few short prickles; leaves opposite, simple, glabrous, exceeding the internodes, long-stalked but petioles shorter than blades, blades oval from a well-marked cordate base, apex shortly acuminate, 7-nerved; male spikes . . . ; female spikes simple, lax, in axillary fascicles of 3 to 4, bracts shorter than the sessile flowers, acuminate from a broadly triangular-ovate base, perianth-segments narrow, lanceolate to linear-lanceolate, staminodes inserted at their base and about $\frac{1}{3}$ their length, consisting of a broad filament with an aborted anther-like top, style-column bluntly conical, ending in 3 shortly recurving stigmas ovary triangular not winged.

Leaf-stalks 2 to $2\frac{1}{3}$ in. long, blades $3\frac{1}{4}$ to $3\frac{1}{2}$ in. by 2 to $2\frac{1}{3}$ in. broad. Flower-spikes reaching $4\frac{1}{2}$ in. long, bracts 1 line long, flowers 2 lines long, perianth-segments 1 line, style with stigmas $\frac{1}{2}$ line.

Near *D. sativa* L. but distinguished by its narrower oval leaves, which recall those of *D. alata* Willd., and by its prickly stem.

Golungo Alto.—Climbing in open woods by streams near Sange. No. **4036**.

6. **D. alata** Willd. Sp. Pl. iv. p. 792 (1805); Kth., *l.c.*, p. 387; Welw. Apont. p. 543 (1859); Durand & Schinz, *l.c.*, p. 273.

Loanda.—Cultivated rather rarely in Loanda in the gardens at the Museque do Sr. Schut; not yet in flower. March 1854. No. **4030**. Introduced from Sierra Leone; cultivated in a garden. May 1854. No. **4044**.

7. **D. odoratissima** Pax, *l.c.*, p. 146; Durand & Schinz, *l.c.*, p. 274.

Golungo Alto.—Everywhere, especially in palm woods between Sange and Bango Aquitamba and towards Quilombo-Quiacatubia. In male fl. and fr. Dec. 1855 and after. Nos. **4035**, **4036**. Coll. Carp. 1011.

Near *D. prehensilis* Benth.

8. **D. minutiflora** Engl. Bot. Jahrb. vii. p. 332 (1886), xv. p. 146 (laps. *multiflora*) t. viii. (1893); Durand & Schinz, *l.c.*

Island of St. Thomas.—No. **4042**.

Represented only by two pairs of leaves; determination doubtful.

9. **D. Welwitschii** Rendle sp. nov.

Shoots long and whip-like; stem glabrous, apparently terete, longitudinally wrinkled when dry; leaves glabrous, subascending, shorter than the internodes, petioles $\frac{1}{2}$ to $\frac{2}{3}$ the length of the blade; blade 7-nerved, obsoletely trilobed, middle lobe rounded with apex abruptly long-apiculate, lateral lobes subrhomboid, base cordate-hastate. Internode between the two uppermost leaf-pairs 8 in. long. Leaves somewhat ivy-shaped; petiole $1\frac{1}{2}$ to 3 in., blade 4 to 5 in. long and as broad at the base; the sharp subulate apiculus reaches nearly 1 in. in length. Flowers and fruit absent.

Golungo Alto.—Very thick woods Sobato Quilombo-Quiacatubia. Feb. 1855. No. **4041**.

Apparently near the West African *D. colocasiæfolia* Pax (*l.c.*, p. 145), but distinguished by its not winged stem and very characteristic more isodiametrical leaf.

10. **D.** sp.

Leaves only. Stem leaf-stalks and leaves shortly ferruginously tomentose. Leaves opposite, simple, stalk about half the length of the blade, blade 7-nerved, orbicular-cordate, apex shortly abruptly acuminate.

SIERRA LEONE.—Sept. 1853. No. **4043.**

*Leaves palmately compound.*

11. **D. triphylla** Schimp. ex Kunth, *l.c.*, p. 436 (non L.).

Var. **tomentosa** Rendle var. nov. distinguished by the densely softly tomentose lower leaf-face.

GOLUNGO ALTO.—Somewhat plentiful in thickets at the openings of woods. Near Bango. In fl., male and female, and fr. Feb. and June 1855. No. **4052.**

SIERRA LEONE.—A high climbing herb, apparently dicœcious. Here and there in places once cultivated near Freetown. Sept. 1853. No. **4051.**

12. **D.** sp.

GOLUNGO ALTO.—A suffruticose widely climbing herb with bifoliolate leaves covered beneath with a white tomentum. Fruiting racemes pendulous. Fruit triangular. Seeds winged. Sange, 1856. COLL. CARP. 1009.

Apparently near *D. triphylla* Schimp.

13. **D.** sp.

Genus probabilit. novum Welw. Apont. p. 587, No. 41 (1859).

GOLUNGO ALTO.—A new genus of Dioscoreaceæ, certainly not recorded for the Niger Flora. Suffruticose, climbing, trifoliolate, with broad hairy leaflets. Flowers not examined. A great ornament in woody thickets. August 1857. COLL. CARP. 1010.

Material consists only of broken capsules and seeds. The capsules resemble those of *D. triphylla* Schimp. The seeds are 1½ in. long, brown with a delicate membranous light brown translucent bluntly linear-oblong unilateral wing.

14. **D. Quartiniana** Rich. Tent. Fl. Abyss. ii. p. 316, t. 96A (1851); Durand & Schinz, *l.c.*, p. 275.

*D. Quartiniana* var. *Hochstetteri* Engl. Hochgeb. Trop. Afr. p. 172 (1892); Durand & Schinz, *l.c.* Var. *pentadactyla* Pax, *l.c.*, p. 148; Durand & Schinz, *l.c.* *D. pentadactyla* Welw. ex Pax, *l.c.*, p. 149.

GOLUNGO ALTO.—An undersbrub, stem woody at the base, widely climbing, leaves 5- to 3-foliolate, with bulbils in the axils of the curved deflexed petioles. Leaflets densely marked with pellucid striæ. Flowers not seen. Very dense thickets by the spring of Quinquélequéle. End of Dec. 1855. No. **4046.** *D. pentadactyla* Welw. ♀. In thickets among the palms by the river Cuango near Sanche; Feb. 1856. No. **4047.** A dicœcious plant with tuberculated rhizome, Quilombo, Feb. 1855. No. **4048.** A climbing herb with the old stem subshrubby, leaves alternate 3- to 5-foliolate, root tuberous. Flowers green in strobiliform spikes protected by bracts which are concave at the

base and whitish-green or pale sulphur-coloured. Main peduncles of the spikes springing from the dilated base of the petioles. Everywhere by dense thickets round Sange ; fruit sought in vain. In fl. end of Dec. 1855. No. **4049**. Varzea do Isidro Coango. In fl. April to May, but did not fruit. No. **4050**.

Huilla.—*D. pentadactyla* Welw. A climber with tuberous root. By hedges and margins of woods, but not plentiful from Lopollo to Jáu. Male flower and unripe fruit Dec. and March 1860. No. **4045**. A climbing shrub, with 5-digitate leaves and white-yellowish flowers. By hedges near Huilla, behind Catumba, May 1860. Coll. Carp. 88.

## XI. LILIACEÆ.

### Tribe I. *SMILACEÆ*.

1. **SMILAX** L. ; Benth. & Hook. f. Gen. Pl. iii. p. 763.

1. **S. Kraussiana** Meisn. ex Krauss in Flora 1845, p. 312 ; Baker in Trans. Linn. Soc. ser. 2. i. p. 264 ; A. De Cand. Mon. Phan. i. p. 171 ; Durand & Schinz, Consp. Fl. Afr. v. p. 279.

*Smilax* spp. Welw. Apont. p. 543 ; Synops. p. 56 (Salsaparrilha de Angola).

Golungo Alto.—Suffruticose high-climbing, leaves leathery, root with fascicled fibres as in *S. Sarsaparilla*. Thickets near Sange, August 1857. No. **3861**. Rhizome moniliform-tuberous, tubers oblong soon becoming woody, provided with very long cylindrical thick fibres, very like those of *S. Sarsaparilla*, regularly arranged along the whole length ; leaves shining above. Even the root-fibres are aculeate. Climbing far and wide in more lofty woods and dense thickets. By the cataracts of the Cuango. Picked in fl. in May, in fr. in June. No. **3862**. In palm woods round Cambondo and Sanches, very rarely flowering ; Jan. 1855. No. **3863**.

Ambaca.—A small shrub 2 to 3 ft. high, erect, stem prickly, leaves broad, leathery, shining. Flowers white to reddish. Root long fibrous, closely resembling the rootlets of *S. Sarsaparilla*. Plentiful on thicket-grown hills between Isanga and N-gombe (stronghold of the chief of Ambaca). In fl. Oct. 1856. No. **3860**.

Huilla.—Wooded places round the great lake Ivantâla, but not plentiful. In fl. 27 Feb. 1860. No. **3864**. Plentiful in the rocky primitive woods of Serra da Xella, not far from the highest peaks. In fl. Oct. 1859. No. **3865**.

### Tribe II. *ASPARAGEÆ*.

2. **ASPARAGUS** L. ; Benth. & Hook. f. Gen. Pl. iii. p. 765.

1. **A. scoparius** Lowe in Trans. Camb. Phil. Soc. iv. p. 11 (1831) ; Baker in Journ. Linn. Soc. xiv. p. 610 ; Durand & Schinz, Consp. Fl. Afr. v. p. 289.

Madeira.—Near *A. officinalis* but suffruticose or almost shrubby, with stem woody below. Rocky places near streams between Funchal and Camara dos Lobos. In fl. end of August 1853. No. **3853**.

2. **A. equisetoides** Welw. ex Baker in Trans. Linn. Soc. ser. 2. i. p. 253 (1878) ; Durand & Schinz, *l.c.*, p. 284.

Pungo Andongo.—Widely cæspitose, resembling marsh-growing Equisetums, in sandy places on the right of the river Cuanza. Without

fl. 6 Feb. 1857. No. **3846**. An undershrub (?) spiny, with a woody tuberous many-headed root, widely cæspitose, 1½ to 2 ft. high forming thickets. Habit of *Asparagus*, but without flowers. Sansamanda, 1 May 1857. No. **3847**.

3. **A. benguellensis** Baker, *l.c.*; Durand & Schinz, *l.c.*, p. 283.

Huilla.—Wooded thickets near Mumpulla; Oct. 1859. No. **3873**.

Mossamedes.—A small decumbent shrub (perhaps a tree-climber in the woods), stem compressed angled, branches and branchlets slightly compressed subangular. Flowers white, spreading not nodding. Here and there near Mossamedes in a place called "as Hortas." In fl. 5 July 1859. No. **3872**.

4. **A. psilurus** Welw. ex Baker, *l.c.*; Durand & Schinz, *l.c.*, p. 287.

Pungo Andongo.—Cazella-Lutete, 18 Oct. 1856. No. **3868**. Somewhat sparsely in sandy woods between Candumba and Lombe, March 1857. No. **3869**. A herb with a woody base and tuberous woody root, 2 to 3 ft. high, erect with spreading branches; flowers whitish, nodding. Plentiful in thickets on the Cuanza between Mopopo and Sansamanda. In fl. 1 May 1857. No. **3870**. Plentiful in sandy thickets around the præsidium, especially near Caghuy. In fr. Dec. 1856. No. **3871**.

5. **A. angolensis** Baker, *l.c.*, p. 254; Durand & Schinz, *l.c.*, p. 282.

Huilla.—Near Ferrão. Dec. and March 1859 and 1860. No. **3879**. Scarcely separable from some of the Abyssinian plants which Baker includes in *A. asiaticus* L.

6. **A. deflexus** Baker, *l.c.*; Durand & Schinz, *l.c.*, p. 284.

Pungo Andongo.—Lutete. In fl. 18 Oct. 1857. No. **3874**.

7. **A. pubescens** Baker, *l.c.*; Durand & Schinz, *l.c.*, p. 287.

Huilla.—Rather dry pastures near Catumba. In fl. Dec. 1859, in fr. Feb. 1860. No. **3878**.

8. **A. africanus** Lam. Encyc. i. p. 295 (1783); Baker in Journ. Linn. Soc. xiv. p. 619, in Trans. Linn. Soc., *l.c.*; Durand & Schinz, *l.c.*, p. 281.

Ambaca.—A slender twiner, widely climbing. Stems dull red, shining, very tough, flexuous, hard, 5 to 12 ft. long. Leaves green, not stiff or succulent. Plentiful on rocky hills between Isanga and N-gombe, growing with a climbing *Bauhinia*. With flower-buds Oct. 1856. No. **3877**.

Pungo Andongo.—A lofty climbing shrub, with long pendulous branches and branchlets. Open woods between Condo and Quisonde, and near Calundo. Without fl. March 1857. No. **3851**. A shrub 4 to 6 ft. high, many-stemmed from the base, stems erect very much branched with long strong prickles. Thickets near the banks of the river Cuanza near Candumba. Without fl. March 1857. No. **3852**. Suffruticose, climbing far and wide, deep green. Berry smaller than usual. Woods of Quilanga, and near Quibonga. In fr. Jan. 1857. No. **3875**. By the road on the way to Cambonde, April 1857. No. **3876**. Diffusely creeping, densely branched, and very densely leaved. Berries red. Mata de Pungo, Dec. 1856. Coll. Carp. 1036.

9. **A.** sp.

There are no flowers; but the plant is apparently near *A. africanus* Lam. Welwitsch gives it a new name, and suggests its identity with the plant referred to in Webb Spicil. Gorg. p. 181.

Cape Verde Islands.—A shrub with spreading branches; branches sometimes elongated, but generally shortened, reflexed, the longer pendulous. Flowers whitish. Plentiful in the higher parts of St. Vincent's Island, on Monte Verde, growing in rocks along with *Sarcostemma Daltoni* Hook. In fl. end of Aug. 1853. No. **3880**.

10. **A. racemosus** Willd. Sp. Pl. ii. p. 152 (1799); Baker in Journ. Linn. Soc., *l.c.*, p. 623, in Trans. Linn. Soc., *l.c.*; Durand & Schinz, *l.c.*, p. 287.

Loanda. — Perennial, leaves herbaceous-green, rather stiff, the younger almost straight, the mature finally falcate. A very elegant high climber on palms, etc., with very long finally hanging branchlets. Sporadic in thickets through the whole district of Loanda. Near Forte de Penedo and Alto das Cruzes. In fr. and fl. beginning of July 1854. No. **3848**. A slender creeping shrublet, sometimes climbing among shrubs, sometimes hanging from the branches of the more lofty of them. Thickets of Alto das Cruzes. Without fl. Feb. 1854. No. **3849**.

Barra do Dande.—A pleasant herbaceous-green, climbing far and wide with slender hanging and gracefully waving branches. Woods above the stronghold. Nov. 1853. No. **3850**.

Huilla.—Climbing far and wide; in wooded thickets. Feb. and March 1860. No. **3855**.

11. **A drepanophyllus** Welw. ex Baker in Trans. Linn. Soc., *l.c.*; Durand & Schinz, *l.c.*, p. 284.

Golungo Alto.—Sporadic in thick woods on the mountains of Alta Queta. In leaf Jan., in fl. May 1855 and 1856. No. **3858**. A high climber, finally hanging, with herbaceous-green distichous falcate leaves. Sange. No **3859**.

Pungo Andongo.—A suffrutescent herb, climbing high and wide. Dense woods at Pedra Cabonda. Without fl. Jan. 1857. No. **3857**.

The specimens under the following numbers are too fragmentary for specific determination :—

Pungo Andongo.—No. **3881**.

Benguella.—Sandy thickets on the banks of the river Cavado (now dry). Without fl. June 1859. No. **3856**.

Huilla.—Lopollo. Dec. 1859. No. **3854**.

Huilla.—A shrub with many shoots, high climbing, then hanging, very pleasing and well worth cultivating. Lopollo. May 1860. Coll. Carp. 58.

3. **NOTOSCEPTRUM** Benth. in Benth. & Hook. f. Gen. Pl. iii. p. 775.

1. **N. angolense** Benth., *l.c.*

*N. andongense* Baker & Engl. in Engl. Bot. Jahrb. xv. p. 470 (1893); Durand & Schinz, Consp. Fl. Afr. v. p. 295. *Kniphofia andongensis* Baker in Trans. Linn. Soc. ser. 2. i. p. 246 (1878).

Pungo Andongo.—A genus very similar in habit to *Kniphofia* but differing in the deeply campanulate perianth and other characters; to be placed between *Kniphofia* and *Aloe*. A giant acaulescent herb,

with tuberous root, tuber conical, descending or vertical, bearing on all sides thick fleshy fibres 1 to 1½ ft. long. Leaves 9 ft. long, linear, sheathing at the base, with a winged keel, long-acuminate, young ones 3 ft. erect, full grown on the flowering-plant, hanging limply or arcuately spreading. Scape radical, central, nearly 8 ft. high, almost an inch thick, juicy and fleshy, cylindrical, erect, naked, bracteate a little below the spike, bracts white scarious with a broad base and elongated linear very acuminate apex, the upper ones short. Flowers in a very dense spike, with a very short stalk, greenish in bud, spike cylindrico-conical, apex subobtuse. Open flowers probably reddish and nodding, but only buds and berries were seen. Ovary in the bud ovate-spherical, trigonous, style filiform with a slightly thickened stigmatic apex. In the bud condition the spikes are eaten like Asparagus by the blacks. Rocky thickets with deep grass and deep-grassed marshy places on the præsidium between Luxillo and Catete, May 1857. Native name Tongo. Nos. **3733**, **3734**. Radical leaf 9 ft., stem 12 ft. high. In leaf Luxillo, Jan. 1857. No. **3735**.

2. **N. benguellense** Benth., *l.c.* ; Durand & Schinz, *l.c.*
*Kniphofia benguellensis* Welw. ex Baker, *l.c.*

Huilla.—A fine herb 3 to 5 ft. high, giving forth a tuft of leaves from a thick densely fibrous rhizome ; from the centre rises an erect scape which scarcely overtops the leaves. Leaves lanceolate-linear, very long-acuminate, channelled, keeled, subrigid, erecto-patent. Flowers bright yellow, bract ovate, white, membranous-scarious. Perianth subsessile, campanulately expanded almost from the base, lobes ovate spreading. Stamens 6 exserted, alternate ones a little shorter, filaments compressed white, anthers yellow. Ovary 3-locular. Style terminal, filiform, gradually passing into an obsoletely papillose stigma, at first bent, then erect. Capsule almost globose, very shortly stalked, dull yellowish, cartilaginous, shiny. Seeds in two series, horizontal, angular, testa dull-coloured. Marshes by streams growing with *Aroides hastatum* and *Epilobium*. Flowers Dec., Jan. In fl. and fr. Jan. 1860. No. **3736**. Plentiful in marshy places on islands near Lopollo, Jan. 1860. Coll. Carp. 8.

4. **ALOE** L. ; Benth. & Hook. f. Gen. Pl. iii. p. 776.

1. **A. angolensis** Baker in Trans. Linn. Soc. ser. 2. i. p. 263 (1878), in Journ. Linn. Soc. xviii. p. 162 ; Durand & Schinz, Consp. Fl. Afr. v. p. 303.

Barra do Bengo.—Subacaulescent but a fine plant, and the most robust of all the species except the arborescent. Leaves rosulate, sub-erect, 2 ft. long, lanceolate, not spotted beneath, with a copious yellowish resin, very juicy and fleshy, glaucous ; apex subobtuse, toothed and crested, twisted to the left ; margin distantly aculeate (not sinuate-aculeate) ; base amplexicaul ; back not punctate nor carinate, marked with a blunt line not everywhere to be seen and never well-developed. Flowers sulphur-yellow, shortly pedicelled, pendulous, in pyramidal racemes. Scape lateral, 3 ft. long, as thick as a finger, straight, shining green, with a reddish bloom, compressed at the base, and distantly aculeate on the two edges, naked, gradually passing above into a cylindrical form, longitudinally striate, sometimes simple, sometimes with 1 to 3 branches, branches spreading, racemose. Bracts below the racemes broadly ovate-acuminate, among the flowers elongate-ovate, scarious, white, with dark lines, erect, margin white, membranous. Mutollo, 29 July 1858. No. **3728**.

2. **A. zebrina** Baker in Trans. Linn. Soc., *l.c.*, p. 264, in Journ. Linn. Soc., *l.c.*, p. 167; Durand & Schinz, *l.c.*, p. 314.

Barra do Bengo.—Stem short, about ½ ft., leafy from the base. Leaves rosulate, spreading horizontally, finally recurved, with a broad sheathing base, lanceolate, long-acuminate, hard and thickly fleshy, convex beneath, obtusely channelled above, glaucescent, marked on both sides with white areas which are parallelogram-shaped with broken ends, and arranged in irregular longitudinal series, margin with sharp red teeth, spreading at right angles in the middle of the leaf, the lower spreading upwards the upper downwards. Flowers brick-red, horizontally spreading, soon nodding. Plentiful on dry hills from Quicuxe towards Cacuaco, very social. July 1854. No. **3721**. Very plentiful in clayey sandy thickets behind Loanda round Quicuxe. In fl. Jan., Feb., Mar. No. **3720**.

Icolo e Bengo.—Stems cæspitose, ½ to ⅔ ft. long, thick, erect, clothed to the base by the leaf-sheaths. Leaves spotted with greenish- and whitish-purple, spots on upper face short and broad, on lower face more linear, arranged in rows, reduced at the white sheaths to narrow dull purple lines; margin sinuately-aculeate, spines stiff, dull-red. Scape 3 to 4 ft., shining red, very smooth, subglaucous and pruinose, branched at the top, flowers in panicled racemes, brick-red, yellowish inside with a globose-ventricose base. Plentiful in very dry places from Funda to Calumguembo. Aug. to Dec., Sept. 1857. No. **3719**.

Libongo.—Stems 1½ to 2 in. in diameter, ascending, densely clothed with recurved withered leaves; leaf-teeth orange-red. Scape nearly 3 ft. central, smooth, dull red, glaucescent, branched. Flowers and the whole habit of the plant almost as in *A. picta*, but flowers a little smaller and tending rather to a brick-orange-red. No. **3723**.

3. **A. platyphylla** Baker in Trans. Linn. Soc., *l.c.*, in Journ. Linn. Soc., *l.c.*; Durand & Schinz, *l.c.*, p. 310.

Pungo Andongo.—A succulent herb, stem 1 to 1½ ft. long, clothed with a rosette of ovate-lanceolate, very thick leaves, scape lateral, 3 to 4 ft., erect, branched in the middle, branches spreading, the central axis longer, livid purple with a reddish bloom. Flowers a livid-copper-purple, horizontally spreading, finally nodding slightly, tube spherically inflated at the base. Leaves with a broad shortly sheathing base, ovate-lanceolate in the young plant, broadly lanceolate in flowering specimens, slightly bent downwards, glaucous-green, marked on the upper face with white oblong spots, paler and not spotted beneath. In fl. 30 April 1857. Very plentiful in dry thickets and in marshy meadows on banks of the river Caranca, near Sansamanda. No. **3722**.

Loanda.—Littoral region. No. **3725**.

4. **A. palmiformis** Baker in Trans. Linn. Soc., *l.c.*, p. 263, in Journ. Linn. Soc., *l.c.*, p. 173; Durand & Schinz, *l.c.*

Huilla.—Shrubby, stem simple at the base, erect, 3 to 5 ft., sparsely branched above, branches ascending, with a crowded apical crown of leaves. Leaves glaucous-green, thick, succulent, rigid, brittle, lanceolate from an amplexicaul base, long-acuminate, margin sinuately serrate, teeth ending in a hard red mucro. Perianth cylindrical, straight, lobes regular, inner a little broader, erecto-spreading, obtuse, non-appendiculate; stamens straight. Flowers nodding, coralline-scarlet, buds greenish at the tip, yellowish inside at flowering-time, lobes banded with red. One of the loveliest species, which, when not in flower, resembles a pretty little palm, as the leaves are crowded

together at the end of the stem, descending at first, then raised upwards, and finally half-spirally rolled backwards at the tip. Plentiful in the more lofty rocky woods of Morro de Lopollo. In fl. April 1860. No. **3726**. A shrub with a stem 1 to 1½ ft. long. Without leaves in the rocky shrubberies of Morro de Lopollo. May 1860. No. **3731**.

5. **A. andongensis** Baker in Trans. Linn. Soc., *l.c.*, in Journ. Linn. Soc., *l.c.*; Durand & Schinz, *l.c.*, p. 303.

Pungo Andongo.—Caulescent, stem 1 to 2 ft. long, branching 2 to 3 times, branches ascending. Leaves lanceolate, very acuminate, thick, fleshy, glaucescent, arcuately recurved, crenately dentate. Flowers yellow to brick-red. Very plentiful on rocks of the præsidium, flowering from January to the end of April. No. **3729**.

6. **A. littoralis** Baker in Trans. Linn. Soc. *l.c.*, in Journ. Linn. Soc., *l.c.*, p. 174; Durand & Schinz, *l.c.*, p. 308.

Barra do Bengo.—Arborescent, trunk 6 to 10 ft., not often higher, as thick as the arm or, more rarely, the thigh; erect or ascending, simple, very rarely branched, generally with a single crown of spreading leaves, and clothed beneath the crown with bent-back withered leaves, rough with the scars of fallen leaves from the base to the middle. Leaves 2 to 3 feet or even longer. Flowers coral-red, scape lateral paniculately branched, sometimes 4 to 5 ft. high. Very plentiful on dry hills with a sandy clayey soil, in the whole littoral region of Loanda, diminishing in the higher parts and absent in the rocky woody region. Imbondeiro dos Lobos, near Maianga do Poro, and elsewhere. In fl. May to July 1854. No. **3727**.

Loanda.—A small tree with *Yucca*-like trunk, and flower-panicle 5 to 6 or even sometimes 8 ft., flowers scarlet pendulous. Plentiful on dry hills between S. Pedro and Cacuaco. Fl. June and July. End of July 1854. Coll. Carp. 123.

Material insufficient for specific determination:—

S. Jago (Cape de Verde Is.).—Subcaulescent; leaves erect, spreading, lanceolate, thick, glaucescent. Probably introduced. In sunny rocky places on the island not far from the city Villa da Praia and somewhat plentiful. Jan. 1861. No. **3730**.

Zenza do Golungo.—Short stemmed, leaves crowded at the base of the stalk in many rows, spreading, very thick and fleshy, becoming ovate-lanceolate from a very broad amplexicaul base, glaucous-green, with numerous white streaks; scape 3 to 4 ft., brick-red, flowers flesh-red. Dry thicket-grown plains near Calumguembo. In scanty fl. and fr. Sept. 1857. No. **3724**. Perhaps *A. zebrina* Baker.

Amberiz.—Radical leaves never seen. Dry woods near Mubongo. Nov. 1853. No. **3718**.

5. **HAWORTHIA** Duval; Benth. & Hook. f. Gen. Pl. iii. p. 777.

1. **H. angolensis** Baker in Trans. Linn. Soc. ser. 2. i. p. 263 (1878), in Journ. Linn. Soc. xviii. p. 210 (1880); Durand & Schinz, Consp. Fl. Afr. v. p. 316.

Huilla.—A herb; leaves with backwardly pointing spines, glaucous, rather flat, long-acuminate, erect, bulb large, scales fleshy dull rose-coloured, ovate-lanceolate, loosely imbricate; flowers brick-red-cinnamon, spreading. Rather rare in rocky sandy thickets near Huilla. In fl. Nov. 1859. No. **3756**.

TRIBE III. *DRACÆNEÆ*.

6. **DRACÆNA** L.; Benth. & Hook. f. Gen. Pl. iii. p. 779.

1. **D. arborea** Link. Enum. Hort. Berol. p. 341 (1821); Baker in Journ. Linn. Soc. xiv. p. 528 (1875).

GOLUNGO ALTO.—A small tree 8 ft. high, palm-like, not branched. Without flower. Molemba Alta, Feb. 1855. No. **3737**.

The specimen consists only of two detached leaves, and the determination is doubtful.

2. **D. parviflora** Baker in Trans. Linn. Soc. ser. 2. i., p. 252 (1878); Durand & Schinz, Consp. Fl. Afr. v. p. 329.

GOLUNGO ALTO.—A tree 20 to 35 ft. high, dichotomously branched, branches erect-spreading, sometimes almost erect, leaves in a palm-like crown; flower-panicles or thyrsi hanging from the top of the trunk or branches. By streams in the more lofty woods of Sobato de Queta and Quilombo-Quiacatubia. With unripe fruit Zenzas do Queta 20 Feb. 1856. Native name Calunga. No. **3739**. 20 to 30 ft., with suberect branches. By streams on the Alta mountains, but sporadic and rarely flowering. Leaves picked in August 1855. No. **3740**.

3. **D. fragrans** Gawl. Bot. Mag. t. 1081 (1808); Baker in Journ. Linn. Soc., *l.c.*, p. 529; Durand & Schinz, *l.c.*, p. 327.

PUNGO ANDONGO.—A small tree 8 to 12 ft., rarely higher, palm-like, lower part of trunk marked with the scars of fallen leaves, leafy towards the top, sparsely branched. Flowers white-rose-coloured, very fragrant. With a few fl. June 1857. No. **3738**.

4. **D. nitens** Welw. ex Baker in Trans. Linn. Soc., *l.c.*; Durand & Schinz, *l.c.*, p. 328.

GOLUNGO ALTO.—A small tree 7 to 10 ft. high, with slender stem. Leaves leathery, shiny, densely crowded at the tops of the branches. Flowers whitish to reddish. Primitive woods between Calólo and Muria, and on the river Lucemuria. In fl. Sept 1854. No. **3742**.

ZENZA DO GOLUNGO ALTO.—Stem 5-7-9 ft. high, 2 in. thick, with a few spreading branches at the top. Leaves a shiny green above, paler beneath. Flowers scented, subfleshy, white-purplish. Plentiful in rocky tall thicket-grown mountainous places near the boundary of Golungo Alto. In. fl. Sept. 1857. No. **3743**.

PUNGO ANDONGO.—A small slender branched tree, with leathery conspicuously shining leaves. Mata de Pungo, without fl.; Dec. 1856. No. **3741**.

5. **D. acaulis** Baker in Trans. Linn. Soc., *l.c.*; Durand & Schinz, *l.c.*, p. 325.

GOLUNGO ALTO.—Perennial with a thick ($\frac{1}{2}$ to 1 in.), diffusely branched, woody, tough rhizome, and leathery evergreen leaves 2 to 6 ft. long; flower-scapes with spreading branches, and scaly base, arising laterally at the base of the leaves. In the more lofty woods and on the banks of streams, in the mountains of Alto Queta and Cungulungulo. By the cataract on the river Cuanza. In fl. July 1855. No. **3752**. Cataract on the river Coango April 1856. No. **3753**.

6. **D. camerooniana** Baker in Journ. Bot. 1874, p. 166.

*D. interrupta* Baker in Trans. Linn. Soc., *l.c.*; Durand & Schinz, *l.c.*, p. 328.

Pungo Andongo.—A half-climbing shrub 3 to 4 ft. high. Flowers white with a very pleasant smell. Plentiful but seen in this one place only in primitive woods on the bank of the river Lombe. In fl. March 1857. No. **3748**.

7. **D. monostachya** Baker in Trans. Linn. Soc., *l.c.*; Durand & Schinz, *l.c.*

Prince's Island.—Berry trilobed, lobes united at the base, spreading stellately above, scarlet. Rather damp herb-grown primitive woods, not far from the sea, sporadic. In fr. Sept. 1853. No. **3744**.

Golungo Alto.—An acaulescent herb, perennial with a hard woody rhizome, which like its fibres has an orange-vermilion colour; leaves long-sheathing, dry and leathery; scape central, a span to a foot long. Flowers . . . Fruit of three ovate-oblong scarlet one-seeded berries united stellately at the base and spreading above. Seed white elliptical very hard and bony. A liliaceous herb resembling *Pontederia* in habit and *Sansevieria* in fruit. Higher parts of Mata de Quisuculo; with a single fruit. 29 April 1856. No. **3745**. A herb 1 to 2 ft. high, with horizontal tuber-bearing rhizome, root-fibres a fine vermilion-orange, as in *Dracæna Draco*. Rather rare, by streams in primitive woods, Quisuculo, Sobato Bango. With unripe fr. Sept. 1855. No. **3746**. Mata de Quisuculo without fl. or fr. August 1857. No. **3747**.

A plant of very doubtful affinity, placed by Baker next to his *D. Afzelii*, from which however it is totally different in habit. As moreover Welwitsch's specimens bear no flowers and the Afzelius specimen has no fruit, the two species have nothing in common.

## Tribe iv. *ASPHODELEÆ*.

### 7. **BULBINE** L.; Benth. & Hook. f. Gen. Pl. iii. p. 784.

1. **B. asphodeloides** Spreng. Syst. ii. p. 85 (1825); Baker in Journ. Linn. Soc. xv. p. 345, in Trans. Linn. Soc. ser. 2. i. p. 261; Durand & Schinz, Consp. Fl. Afr. v. p. 336.

Pungo Andongo.—An *Anthericum*-like herb, with erect leaves and scape. Rather plentiful in open woods near Pedras de Guinga. In fr. Jan. 1857. No. **3775**. Leaves cylindrical, hollow, scapes branched, erect. Woods near Guinga March 1857. Coll. Carp. 1038. Welw. Apont. p. 592, No. 114.

Huilla.—A superb plant with deep yellow almost golden flowers. In more open rather sandy woods consisting chiefly of species of *Protea*, *Parinarium* and *Cæsalpinia*, between Lopollo and Monino. In fl. and unripe fr. Dec. 1859. No. **3774**.

### 8. **SCHIZOBASIS** Baker; Benth. & Hook. f. Gen. Pl. iii. p. 786.

1. **S. angolensis** Baker in Trans. Linn. Soc. ser. 2. i. p. 255 (1878); Durand & Schinz, Consp. Fl. Afr. v. p. 338.

*Adenotheca aphylla* Welw. ex Baker, *l.c.*

Pungo Andongo.—A plant with a solid bulb, white inside, juicy and fleshy, viscid, generally whitish-green outside, 1 to 1½ in. in diameter; a number of them generally crowded in the crevices of the rocks. Stem 1 to 2 ft., leafless, dichotomously branched above, setaceous, generally hanging loosely on the cliffs, but more erect when flowering. Flowers scattered, white-greenish, borne laxly on the uppermost branches, peduncles sheathed at the base with whitish-

reddish bracts. Perianth 6-partite to the base, ovate-campanulate, narrowing and equal at the mouth, greenish-white, narrowing pyramidally after flowering; stamens 6, included, equal, inserted on the base of the segments; filaments white, flattened, somewhat dilated at the base; anthers large, ovate, introrse, dorsifixed, dehiscing longitudinally. Ovary oblong, triquetrous, bearing a yellow linear-oblong gland between the angles. Style rather long, central, stigma truncate. Plentiful in rocky places near springs on the præsidium, growing with Orchids and Asclepiads, especially round Catete and Luxillo. In leaf and fr. Nov. 1857. Nos. **3866, 3867.** Bulbs with stems were not infrequently found from Oct. to May. Welwitsch saw flowers only in specimens cultivated in Golungo Alto in August 1857.

9. **ERIOSPERMUM** Jacq.; Benth. & Hook. f. Gen. Pl. iii. p. 786.

1. **E. stenophyllum** Welw. ex Baker in Trans. Linn. Soc. ser. 2. i. p. 261 (1878); Durand & Schinz, Consp. Fl. Afr. v. p. 341.

Pungo Andongo.—Tuber fairly large, depressed, fibrous at the lower margin, flesh not blood-red as in the remaining species. Perianth sulphur-coloured, connivent, reddish at the hooded apex. Sandy thicket-grown meadows on the banks of the Cuanza near Candumba, where tubers with leaves were picked in March 1857. Flowered in Welwitsch's Loanda garden 29 Nov. 1858, and middle of April 1859. No. **3758.**

2. **E. andongense** Welw. ex Baker, *l.c.*; Durand & Schinz, *l.c.*, p. 339.

Pungo Andongo.—An acaulescent herb with a large depressed hemispherical or hemispherico-conical tuber, flattened beneath, with fibril-bearing margin, and blood-rose-red flesh, giving off after the flowers have withered a solitary oblong or elliptical, fleshy-leathery very stiff leaf narrowing into a petiole, and suberect or obliquely spreading. Scape 1 to 2 spans or a foot, with a short convolute leaf-like bract, cylindrical, green, polished, generally twisted, passing into a raceme 2 to 4 in. long. Flowers with elongated peduncles bracteate at the base, sulphur-yellow. Perianth 6-partite, at first urceolate-campanulate, open when mature, soon closing again, lobes more or less obovate-spathulate, sulphur-yellow with a median purple nerve, apex inflexed, hooded, subequal both in length and breadth; stamens 6 on the base of the segments and shorter than them, those opposite the outer segments the shorter. Anthers oblong-cordate, emarginate, erect, ripening successively. Ovary ovate-trigonous, style obsoletely trigonous, straight; stigma very minutely muriculate. Mature fruit not seen. Plentiful in thickets and open woods near Caghuy and elsewhere round the præsidium. Tuber and leaves found in Nov. 1856; also plentiful in sandy-clayey thickets between the streams Casalale and Miège, in leaf Dec. 1856. Flowers examined at the end of Nov. 1857 in own garden at Loanda. No. **3757.**

For information as to the flowers we depend entirely upon Welwitsch's description given above; there are none on the herbarium specimens, and he himself says, "I have looked in vain for the flowering scape in the herbarium."

3. **E. flexuosum** Welw. ex Baker, *l.c.*,; Durand & Schinz, *l.c.*, p. 340.

Huilla.—Plentiful in rather damp pastures between Humpata and Lopollo. Beginning of Nov. 1859. No. **3760.**

4. **E. paludosum** Baker, *l.c.*; Durand & Schinz, *l.c.*

Pungo Andongo.—A herb with compact tuber, bearing long fibres, with a blood-red-purple flesh; leaves leathery, glaucous-green, appressed to the earth; scape a span high, flowers yellow. Plentiful in marshy places from Candumba and Mutollo to Quisonde. In fl. Jan. and March 1857. No. **3761**.

5. **E. ophioglossoides** Welw. ex Baker, *l.c.*, p. 262; Durand & Schinz, *l.c.*

Huilla.—Flowers a washed-out yellow, with dull purple nerves, pedicels rather stiff. Leaves somewhat fleshy glaucous-green. Rather damp pastures with short herbage; Lopollo, in one place only but plentiful there. In fl. and fr. Nov. 1859. No. **3759**. Rather damp pastures near Humpata and Lopollo. Beginning of Dec. 1859. No. **3763**.

Material insufficient for specific determination.

Pungo Andongo.—Tuber a violet-purple inside. Plentiful in sandy pastures near Quitage. In leaf end of March 1857, No. **3762**.

10. **ACROSPIRA** Welw. ex Baker; Benth. & Hook. f. Gen. Pl. iii. p. 787.

1. **A. asphodeloides** Welw. ex Baker in Trans. Linn. Soc. ser. 2. i. p. 255 (1878); Durand & Schinz, *l.c.*, p. 341.

Pungo Andongo.—A genus near *Anthericum*, but differing in its divided stem, filaments broadly dilated at the base, anthers spirally rolled at the apex, triquetrous-lobed ovary, etc. A herb with a tuberous root, tubers broadly depressed as big as a fist, arranged in a moniliform series; stem 6 to 8 or even 9 ft., orange, hard and woody, erect; leaves 3 to 4 radical, erect, 2 to 4 ft. long, scarcely 1 in. broad, linear to lanceolate, long-acuminate, channelled, distichously sheathing at the base, and folded for some distance upwards, somewhat acutely carinate, subglaucous and subrigid. Stem clothed to the base of the inflorescence with dry reduced sheath-like leaves. Inflorescence pyramidately racemose, 1 to 1½ ft. long, once or twice branched at the base. Flowers in small somewhat remote racemes of 2 to 5; bracts scarious, red-nerved. Perianth petaloid, lobes subfleshy, white with a purple keel, the outer a little broader, all of equal length, erect to spreading at flowering time. Stamens a little shorter than the perianth, anthers linear-lanceolate erect, with sagittate base, bilocular, loculi polliniferous at the apex, which becomes bent and finally spirally rolled, filled in the middle and below with a waxy viscid non-fertile substance. Ovary sessile, ovate-oblong, 3-locular. Style filiform, deflexed-ascending, slightly thickened towards the apex, ending in a small thick brush-like stigmatic head. Plentiful on the higher rocks of the præsidium, at Pedra Songue and at the great cataract of the river Cuanza near Condo. In fl. March and April 1857. Nos. **3777**, **3778**, **3779**.

11. **ANTHERICUM** L.; Benth. & Hook. f. Gen. Pl. iii. p. 778.

1. **A. andongense** Baker in Trans. Linn. Soc. ser. 2. i. p. 257 (1878); Durand & Schinz, Consp. Fl. Afr. v. p. 341.

Pungo Andongo.—A perennial herb, with a fibro-tuberous root, erect, acaulescent. Leaves subrigid and somewhat fleshy. Flowers white. Marshes near Candumba on the river Cuanza, Jan. 1857. No. **3797**. Sandy damp woods between Luxillo and Cazella. In fl. and fr. Jan. 1857. No. **3798**.

2. **A. dissitiflorum** Baker, *l.c.* ; Durand & Schinz, *l.c.*, p. 343.

Pungo Andongo.—A tuberous herb, tubers with long fibres which are again tuberously swollen. Flowers white. Plentiful in damp pastures near Condo. March 1857. No. **3781.**

Scarcely more than a dwarf variety of *A. andongense* Baker.

3. **A. tenellum** Welw. ex Baker, *l.c.*, p. 256 ; Durand & Schinz, *l.c.*, p. 347.

Huilla.—Sometimes growing singly, sometimes rather widely cæspitose. Flowers whitish. Rather damp somewhat sandy thinly thicket-grown pastures near the base of Morro de Monino and on the more lofty heights of Morro de Lopollo. With fl. and unripe fr. Dec. 1859. No. **3796.**

4. **A. calyptrocarpum** Baker, *l.c.*, p. 258 ; Durand & Schinz, *l.c.*, p. 342.

Huilla.—Flowers whitish with broad dull purple nerves, perianth marcescent adhering to the mature capsule, its apex closely twisted into a style-like process, finally split round the base of the ripe capsule by the spreading valves and separating like a calyptra. Seeds black, minute, flattened, quadrate or triangular. Rocky pastures which are flooded in the rainy season between Mumpulla and Lopollo. Almost past flowering, end of Dec. 1859. No. **3786.**

5. **A. ustulatum** Welw. ex Baker, *l.c.* ; Durand & Schinz, *l.c.*, p. 348.

Pungo Andongo.—Boggy sunny wooded places at Mutollo. With a few fl. and fr. March 1857. No. **3800.**

Huilla.—Pastures flooded in the rainy season, now dry. In fl. and fr. April 1860. No. **3801.**

6. **A. benguellense** Baker, *l.c.*, p. 257 ; Durand & Schinz, *l.c.*, p. 342.

Huilla.—Flowers whitish streaked with dull purple ; rather fugacious. Plentiful in open woods and shady pastures round Lopollo and Humpata. In fl. and fr. Jan 1860. No. **3794.**

7. **A. limosum** Baker, *l.c.* ; Durand & Schinz, *l.c.*, p. 345.

Barra do Bengo.—A herb a foot high, with tuberous fibrous root, fibres somewhat fleshy. Leaves subrigid, lanceolate-linear with long distichous sheaths, falcate, green, deeply channelled, acutely keeled, longitudinally striate especially beneath, long-acuminate, exceeding the scape. Scape sharply two-edged, branched at the top. Perianth spreading, white ; filaments flattened, anthers linear-cordate basifixed, loculi broad with a narrow marginal dehiscence, pollen greenish-yellow. Ovary oblong very obtusely trigonous. Style elongated, slightly curved, white, filiform ; stigma with a small papillose head. Pedicels jointed at $\frac{1}{3}$ their length. Flowers horizontally nodding. Very rare in dried-up mud after the floods, from Quicuxe on the way to Cacuaco. In fl. beginning of Aug., without fl. Sept. 1858. No. **3803.** Without fl. 7 Feb. 1859. No. **3804.**

8. **A. orchideum** Welw. ex Baker, *l.c.*, p. 258 ; Durand & Schinz, *l.c.*, p. 346.

Huilla.—A herb with the habit of an orchid, growing subcæspitosely, a foot high, erect, root of fascicled fibres, filipendulous. Flowers whitish. Somewhat rare in rather damp grassy places at the base of Serra de Monino. In fl. Jan. 1860. No. **3806.**

9. **A. arenarium** Baker, *l.c.*, p. 259 ; Durand & Schinz, *l.c.*, p. 342.

Pungo Andongo.—An acaulescent herb with a fibrous root, fibres filipendulous. Leaves rigidly coriaceous. Rather rare in sandy thickets between Candumba and Lombe. In fr. March 1857. No. **3802**.

10. **A. pterocaulon** Welw. ex Baker, *l.c.*, p. 258 ; Durand & Schinz, *l.c.*, p. 346.

Pungo Andongo.—A herb 6 ft. high, with erect flattened two-edged scape. Flowers white. Thicket-grown woods between Calundo and Pedras de Guinga. Only one specimen March 1857. No. **3795**.

11. **A. filiforme** Thunb. Prodr. Pl. Capens. p. 62 (1794).

*A. elongatum* Willd. Sp. Pl. ii. p. 136 (1799). *A. Jacquinianum* Schult. f. Syst. vii. p. 462 (1829) ; Baker in Journ. Linn. Soc. xv. p. 308, in Trans. Linn. Soc., *l.c.*, p. 259 ; Durand & Schinz, *l.c.*, p. 344.

Huilla.—Flowers whitish. Root-fibres very fleshy and brittle. Sandy rather damp scantily herb-grown places near Humpata. A single specimen, in fl. Jan. 1860. No. **3787**. Flowers whitish, fugacious, pedicels jointed. Somewhat rare, in pastures near Ferrão da Sola. In fl. and unripe fr. Feb. 1860. No. **3799**.

Var. **affine** Baker in Journ. Linn. Soc., *l.c.* ; in Trans. Linn. Soc., *l.c.* ; Durand & Schinz, *l.c.*

Pungo Andongo.—A herb with the habit of an Asphodel or small *Anthericum*, perennial by a fleshy fibrous fascicled root ; leaves rather flaccid, spreading, scape oblique or somewhat straight. Flowers white with purple lines. Very plentiful in boggy meadows on the banks of the river Cuanza near Candumba ; Jan. and March 1857, in fl. and fr. Flowers white streaked with red. In marshy meadows between Condo and Quisonde ; in fl. March 1857. No. **3789**.

Var. **longifolium** Rendle, var. nov.

Leaves long narrow-linear with a long tapering apex, shortly hairy, exceeding the simple raceme, fruit-stalk stout and sharply reflexed.

Pungo Andongo.—A herb with fleshy root-fibres, suberect leaves with spreading hairs and whitish purple- or red-streaked flowers. More lofty heights of Serra de Pedras de Guinga. In fl. and fr. Jan. 1857. No. **3788**. Dampish rocky places, Barranco de Lutete. In fl. Jan. 1857. No. **3790**.

Var. **pyrenicarpum** Rendle.

*A. pyrenicarpum* Welw. ex. Baker in Trans. Linn. Soc., *l.c.* ; Durand & Schinz, *l.c.*, p. 347.

Very near var. *longifolium*, but a smaller plant with a very stout scape.

Huilla.—A tuberous pilose acaulescent herb, leaves suberect, subfleshy, compressed, long-acuminate, erect, scapes 1 to 2 radical, lateral, ascending, half as long as the leaves. Flowers white, open from 10 a.m. till 4 p.m., with purple lines on the outside ; fruit a capsule ; peduncles reflexed in the fruiting stage. Damp pastures between Humpata and Gambas. In fl. and fr. Jan. 1860. No. **3791**.

12. **A. molle** Baker, *l.c.* ; Durand & Schinz, *l.c.*, p. 346.

Pungo Andongo.—Leaves plantagineous ; flowers white. Sunny rocky places throughout the whole præsidium. In fl. Nov. to Dec. 1856. No. **3790**.

12. **CHLOROPHYTUM** Ker; Benth. & Hook. f. Gen. Pl. iii. p. 788.

*Dasystachys* Baker; Benth. & Hook. f., *l.c.*, p. 789.

Sect. 1.—EUCHLOROPHYTUM.

1. **C. Afzelii** Baker in Journ. Linn. Soc. xv. p. 323 (1876); Durand & Schinz, Consp. Fl. Afr. v. p. 349.

GOLUNGO ALTO.—**No. 3776.** By streams in rather shady places, Queta, Zengas. April. COLL. CARP. 1045.

2. **C. hispidulum** Rendle, sp. nov.

An acaulescent herb, perennial by means of a tuberous rhizome bearing long subfleshy or string-like spreading fibrous roots; leaves 2 or more, radical, rigid, leathery, spreading, with a broad sheathing base and a long rather broad linear concave petiole, passing very gradually into a narrowly oval acute blade; both faces of blade conspicuously many-nerved, upper face glabrous, nerves of under side and the back of the petiole densely minutely hispidulous; scapes simple or once branched, springing from among, and much shorter than the leaves, stoutish, and similarly hispidulous, with a submembranous acuminate basal bract, and a few short ovate triangular bracts above, the axis and branch each ending in a short dense oblong subcompound head of shortly stalked subglobose bluntly triquetrous fruits; capsules loculicidally dehisced, valves rough and hispidulous outside, polished and faintly horizontally striate on the inside, edges thick and recurving; seeds a dull polished black, with rounded backs and deeply grooved ventral surfaces.

Leaves 9 to 14 in. long, including 2 to 4 in. of petiole, petiole 2 to 3 lines broad, blade $1\frac{1}{4}$ to $1\frac{1}{3}$ in. broad; scape $1\frac{1}{2}$ to $2\frac{1}{2}$ in. long, inflorescence (in fruiting stage) about 1 in. by 7 to 8 lines thick. Capsules scarcely $\frac{1}{4}$ in. long; seeds scarcely 1 line. I have seen no flowers, but the plants look so distinct that I have ventured to describe them as a new species of the *Cannæfolia* section characterised by its tough long-stalked narrow leaves, short simple or forked scape, and short dense hispidulous indumentum.

PUNGO ANDONGO.—Gravelly soil in wooded places between Candumba and Mangue. With opened fr. March 1857. **No. 2805.**

3. **C. macrophyllum** Aschers. in Schweinf. Beitr. Fl. Aeth. p. 294 (1867) (nomen); Baker in Trans. Linn. Soc, ser. 2. i. p. 259 (1878); Durand & Schinz, *l.c.*, p. 351.

*C. leucolepis* Welw. ex Baker, *l.c.*

PUNGO ANDONGO.—A herb, perennial with a fascicled fibrous root and very broad linear radical leaves, 3 to 4 ft. long, fleshy-coriaceous, herbaceous-green, channelled and very obtusely carinate. Scapes central, $1\frac{1}{2}$ to 3 feet or higher, cylindric, bracts linear-lanceolate, semiamplexicaul at the base, whitish-green. Flowers very sweet. Perianth spreading, leaves equal, lanceolate, subobtuse, a fine white. Filaments filiform, subcompressed. Anthers bright yellow, long, narrowly lanceolate, subsagittate, dorsifixed. Ovary obovate-triquetrous, angles obtuse, furrowed; style declinate ascending, stigma with a small finely fibrillar head. The very long bracts are coherent at the

top of the scape, forming a whitish petaloid crown. Rather rare, in rock-crevices near springs, and by streams on the præsidium. In fl. 24 Dec. 1856. Rather rare in Barranco de Catete; in fl. Jan. 1857. No. **3771**.

4. **C. filipendulum** Baker, *l.c.*, p. 260; Durand & Schinz, *l.c.*, p. 350.

Golungo Alto.—A succulent acaulescent herb. Leaves broadly lanceolate, long-acuminate, with a broad sheathing base, shining above, pale beneath, longitudinally striate on each face; root-fibres rather fleshy. Scape lateral, scarcely exceeding the larger leaves, cylindrical, with one or two spreading branchlets. Inflorescence racemose, bracts acuminate, subtending 1, 2, or 3 flowers, and hiding their pedicels. Perianth milk-white, segments partly closed valvately before, during and after pollination. Stamens 6, rather broad, anthers cordate-lanceolate, attached in the basal sinus, dehiscing longitudinally and introrsely; style cylindric, almost exceeding the perianth-segments, stigma papillate. Ovary trigonous, 3-locular, seeds black, angled. Shady places by streams, Queta mountains; a single specimen with almost withered flowers found Dec. 1853. No. **3776**.

5. **C. lancifolium** Welw. ex Baker, *l.c.*; Durand & Schinz, *l.c.*, p. 351.

Pungo Andongo.—A herb with a fibrous root, fibres fleshy and thickened. Leaves with long reddish channelled petioles, blade grass-green. Perianth whitish-green. Stamens straight. Stigma slightly capitellate. Shady places by cataracts on the rocks of the præsidium. Scarcely in full fl. end of Nov. 1856. No. **3772**. Shady woods by streams between Quisonde and Condo. In fr. March 1857. No. **3773**.

6. **C. andongense** Baker, *l.c.*; Durand & Schinz, *l.c.*, p. 349.

Pungo Andongo.—Flowers white. Thicket-grown rocks on all the great cliffs of the præsidium. In fl. Dec. 1856, in fr. Jan. 1857. No. **3770**.

7. **C. debile** Baker, *l.c.*; Durand & Schinz, *l.c.*, p. 350.

Ambriz.—A herb, perennial by a fibrous filipendulous root, leaves subfleshy, glaucous-green, scapes ascending, flowers white, subfleshy. Rocks between Ambriz and Quisembo. Nov. 1858. No. **3769**.

8. **C. stenopetalum** Baker in Journ. Linn. Soc. xv. p. 331 (1876), in Trans. Linn. Soc., *l.c.*; Durand & Schinz, *l.c.*, p. 352.

*C. bracteosum* Welw. ex Baker in Trans. Linn. Soc., *l.c.*

Huilla.—A perennial acaulescent herb with a fleshy fibrous rhizome, densely leafy at the base, leaves lanceolate, closely veined, erect, partly plicate. Flowers whitish-yellow, in a simple raceme, more rarely once to twice branched, almost entirely covered by the bracts. Style straight, stigma truncate not capitellate. Rather rare in little *Protea*-woods near Lopollo. In fl. and unripe fr. end of Dec. 1859. No. **3768**.

Sect. 2.—Dasystachys.

9. **C. pleiostachyum** Durand & Schinz, *l.c.*, p. 352.

*Dasystachys pleiostachya* Baker in Trans Linn. Soc., *l.c.*, p. 255.

*Anthericum ? pleiostachyum* Welw. ex Baker, *l.c.*

Pungo Andongo.—A subglaucous herb 3 to 4 ft. high; bulb large wrinkled, many-fibred, compact, mealy-white inside. Stem straight

almost covered from the base to the middle with the lanceolate-linear, erecto-patulous, channelled, obtusely keeled, glaucous, long-sheathing leaves, simple or once branched, cylindrical, ending in a simple (or with a small basal branch) spike. Flowers white, very shortly stalked, provided at the base with two alternating white petaloid bracts, with a concave base, the inner cuplike. Perianth-segments equal, a splendid white, apex spotted with green on the outside, conniving into a tube up to maturity. Stamens with very thinly membranous flattened filaments slightly dilated at the base, as long as the perianth, anthers exserted at maturity and soon dropped, lanceolate-linear, subobtuse, attached in the emarginate base, introrse. Ovary lobed-triquetrous, ovules numerous obovate, subangled, horizontal. Style filiform, somewhat oblique; stigma a small head. Very rare in deep-grassed meadows near Sansamanda on the river Cuanza. 30 April 1857. No. **3785**.

10. **C. falcatum** Engl. Hochgebirgsfl. Trop. Afr. p. 161 (1892); Durand & Schinz, *l.c.*, p. 350.

*Dasystachys falcata* Baker, *l.c.* *Anthericum? falcatum* Welw. ex Baker, *l.c.*

Huilla.—A herb with a moniliform tuber, leaves distichous, long-sheathing, plicate, glaucescent, subfleshy, channelled, obtusely carinate, falcate, lanceolate, acute with an undulate margin, scape central, 2 ft. long, cylindrical, bearing at the top a 2 to 4 in. dense spike. Perianth-segments subequal, thinly membranous, white, apex apiculate, subcucullate. Filaments of stamens filiform, rather thick; anthers sagittate, basifixed. Style declinate, ascending, gradually passing into the thinly papillose stigma. Ovary lobes obtuse, furrowed on the back. Here and there on the high rocks (5500 ft.) of Morro de Lopollo. In fl. Jan. 1860.

Bumbo.—Open woods composed of "Unteate" (*Copaiba Mopane* O. K.) between Bumbo and Bruco. In fr. Oct. 1859. No. **3792**.

11. **C. colubrinum** Engl., *l.c.*, p. 162; Durand & Schinz, *l.c.*, p. 349.

*Dasystachys colubrina* Baker, *l.c.*, p. 256, t. 35, figs. 5-10. *Anthericum? colubrinum* Welw. ex Baker, *l.c.*

Huilla.—Flowers whitish or streaked with purple. Plentiful, but seen only in the place mentioned, in rocky pastures bearing short herbage at Empalanca at about 5500 ft. high. In fl. and immature fr. Jan. 1860. No. **3784**.

12. **C. campanulatum** Engl., *l.c.*, p. 161; Durand & Schinz, *l.c.*, p. 349.

*Dasystachys campanulata* Baker, *l.c.*, figs. 1 to 4. *Campylandra dasystachys* Welw. ex Baker, *l.c.*

Huilla.—Flowers white. In deeply herb-grown meadows between Lopollo and lake Ivantâla. In fl. and fr. March 1860. No. **3783**.

13. **C.** sp.

Pungo Andongo.—An acaulescent herb, with densely fibrous root, and glaucous stiff thick and leathery leaves, longitudinally striate beneath. Sandy places on the river Cuanza, Feb. 1857. Coll. Carp. 1047.

The fragment included under the following number probably belongs to this tribe :—

Mossamedes.—A bulbous herb. More lofty sandy hills near Serra do Montes Negros. In fr. August 1859. No. **3782.**

A fragment with the remains of a branched scape bearing empty loculicidally dehisced capsules.

### Tribe v. *ALLIEÆ.*

13. **TULBAGHIA** L. ; Benth. & Hook. f. Gen. Pl. iii. p. 798.

1. **T. æquinoctialis** Welw. ex Baker in Trans. Linn. Soc. ser. 2. i. p. 246 (1878) ; Durand & Schinz, Consp. Fl. Afr. v. p. 355.

Pungo Andongo.—Habit recalling that of *Leucojum.* Bulbous ; leaves linear, subglaucescent, erect ; flowers horizontally nodding, spathe 2-leaved, scarious. Corolla white, 6-fid, corona yellow. Rather damp shady places near Banza do Soba Quitage. Single specimen in fl. March 1857. No. **3754.**

14. **ALLIUM** L. ; Benth. & Hook. f. Gen. Pl. iii. p. 802.

1. **A. angolense** Baker in Trans. Linn. Soc. ser. 2. i. p. 262 (1878); Durand & Schinz, Consp. Fl. Afr. v. p. 357.

Golungo Alto.—Bulb narrowly conical, elongated, leaves hollow, subulate, erect, glaucous-green. Scape hollow, a little inflated in the middle, not at the base. Herb-grown places on the banks of the river Quiapose near Terras de Bumba. In fl. May 1855. No. **3764.**

### Tribe vi. *SCILLEÆ.*

15. **DIPCADI** Medic. ; Benth. & Hook. f. Gen. Pl. iii. p. 809.

1. **D. oxylobum** Welw. ex Baker in Trans. Linn. Soc. ser. 2. i. p. 246 (1878) ; Durand & Schinz, Consp. Fl. Afr. v. p. 375.

Pungo Andongo.—Flowers a cinnamon-red, subfleshy and subrigid, outer segments acute. On the slopes bearing short herbage of the huge rocks of the præsidium. In fl. Nov. 1856. No. **3714.**

2. **D. Welwitschii** Baker in Journ. Linn. Soc. xi. p. 400 (1871), in Trans. Linn. Soc., *l.c.* ; Durand & Schinz, *l.c.*, p. 376.

*Uropetalum Welwitschii* Baker in Saund. Refug. Bot. t. 16 (1868).

Huilla.—A bulbous herb, with 1 to 2 channelled subglaucous leaves ; scape 1 ft. long, slender, erect, flowers in a secund raceme, nodding, greenish, outer perianth-segments far exceeding the inner. Capsules obtusely triquetrous or rather trigastrous, while ripening at first almost pendulous, then nodding, or spreading horizontally ; when quite ripe more or less erect. The leaves of plants growing in rocky places or on poor soil are very narrow and channelled right to the tip, in rather damp places are broader and almost quite flat from the middle to the apex. Herb-grown thickets near Lopollo, but rarer than the rest of the species ; Nov. and Dec. 1859. No. **3715.** A herb with the habit of a Hyacinth, flowers somewhat nodding, green, capsules subpendulous, obtusely trigastrous, stem one-leaved. Thickets near Huilla, Nov. 1859. No. **3716.**

Very near the last species.

3. **D. lateritium** Welw. ex Baker in Trans. Linn. Soc., *l.c.*, p. 247 ; Durand & Schinz, *l.c.*, p. 374.

Huilla.—Leaves a foot long, erecto-falcate, linear, long-acuminate, channelled, glaucous-green, with very long sheaths. Flowers a fine brick-red. On the rocky heights of Morro de Monino in the Lopollo district. In fl. and unripe fr. March 1860. No, **3717.**

4. **D. comosum** Welw. ex Baker, *l.c.*, t. 34, figs. 1 to 3 ; Durand & Schinz, *l.c.*

Huilla.—Bulb depressed hemispherical, scales bright crimson, with bulbils at the base, and bearing strong white fibrils in the centre ; scape 3 to 4 ft., more rarely 5 ft., cylindrical, firm, raceme 1½ to 2 ft long, with an elongated comose apex, 30- to 40-flowered. Flowers the colour of *D. serotinum*, nodding up to maturity ; outer perianth-segments in the lower flowers a little longer than the inner, in the upper flowers much longer, elongate subulate ; inner segments of the uppermost flowers aborted. Sandy rather dry thickets between Lopollo and Catumba. In fl. 15 April 1860. No. **3732.**

16. **ALBUCA** L. ; Benth. & Hook. f. Gen. Pl. iii. p. 809.

Sect. 1.—Falconera.

1. **A. myogaloides** Welw. ex Baker in Trans. Linn. Soc. ser. 2. i. p. 250 (1878) ; Durand & Schinz, Consp. Fl. Afr. v. p. 379.

Huilla.—Bulb ovate as big as a hen's egg, scales pale reddish-yellow ; leaves lanceolate with a broader sheathing base, channelled, very long-acuminate, subglaucous green somewhat flaccid at flowering-time. Scape cylindrical ending in a few-flowered raceme. Outer perianth-segments spreading, inner erect with a hooked tip, all white with a median green band. Outer stamens flat sterile,* inner with a broad winged base. Style triangular, deeply trisulcate, stigma trigonous, finely papillose. Bulb a tawny yellow inside. Rocky heights of Morro de Monino, April 1860. No. **3840.**

2. **A. monophylla** Baker, *l.c.*, p. 251 ; Durand & Schinz, *l.c.*

*A. juncifolia* Welw. ex Baker, *l.c.* (non Baker).

Pungo Andongo.—A fleshy succulent bulb, white inside and out. Leaf solitary, sheathing, deeply channelled at the base, glaucous like the scape, from middle to apex cylindrical subulate. Scape cylindrical, about half as long as the leaf. Flowers yellow, somewhat nodding. Inner perianth-segments erect, a little shorter than the outer, thickened and hooked at the apex. Filaments all fertile, broadly winged at the base. Style angled, gradually passing into a finely papillose stigma. Rather rare on the rocky heights of the præsidium, at Pedras de Cabondo. In fl. 17 April 1857 (one specimen only). Rocks of Cabondo, beginning of June 1857. No. **3838.**

Sect. 2.—Pallastema.

3. **A. galeata** Welw. ex Baker, *l.c.* ; Durand & Schinz, *l.c.*, p. 378.

Zenza do Golungo.—A herb with an ovate-conical bulb, root-fibres numerous long, scales dark-coloured, marcescent. Scape 1½ to

* This is at any rate not usual ; the outer stamens have smaller anthers, as Baker states, but that these are polliniferous is shown by examination of the specimen.

2½ ft., straight, radical leaves erect, long-sheathing, channelled, linear-acuminate, a splendid green, longitudinally striate. In the flowering stage the leaves are short (scarcely 3 in. long) subulately convolute and glaucous, afterwards 2 to 3 ft. long, ⅔ in. broad, bright green and rather flat. Flowers scarcely scented, segments whitish-green, with a yellowish tinge, with a broad green median longitudinal band, bracts long and narrowly acuminate from a broad sheathing base, white to purplish; corolla almost bilabiate, the inner uppermost segment helmet-like enclosing 3 stamens closely appressed to its surface; the other three stamens look downwards but are free, not appressed to the corresponding segments. Stamens all fertile, filaments broadly winged at the base, almost covering the ovary. Style columnar, symmetrical, obtusely trigonous, green, gradually narrowing above into an obsoletely trilobulate yellow stigma. Rocky mountain thickets near Quicanda. Sept. 1857. No. **3837**.

4. **A. subspicata** Baker, *l.c.*, Durand & Schinz, *l.c.*, p. 380.

Huilla. — Flowers whitish-green. Lofty rocks of Morro de Monino; rather rare. April 1860. No. **3839**.

5. **A. chlorantha** Welw. ex Baker, *l.c.*; Durand & Schinz, *l.c.*, p. 378.

Pungo Andongo.—Herb with a globose bulb, scape leafy at base, erect; flowers greenish, fleshy. Thickets on the river Cuanza near Quibinda and near Condo. Flowers greenish, tawny yellow when dried. Grassy thickets between Lombe and Quibinda. March 1857. No. **3835**.

6. **A. angolensis** Welw. Apont. p. 591 (1859); Baker in Saund. Refug. Bot. t. 336 (1872), in Journ. Linn. Soc. xiii. p. 290, in Trans. Linn. Soc., *l.c.*; Durand & Schinz, *l.c.*, p. 377.

*A. abyssinica* Welw. ex Baker in Gard. Chron. 1872, p. 392 (non Dryand.).

Golungo Alto.—Grassy slopes (Senú) on the heights of Alta Queta but not plentiful. In fl. middle of April 1855. A bulbous herb 5 to 7 ft. high with large sulphur-coloured flowers. Coll. Carp. 1035.

Cazengo.—Dry plains between Dalatanda and the river Caringa, but rather rare, June 1855.

Huilla.—A herb 3 to 5 ft. high; flowers yellow with broad red bands, erect-spreading, sporadic but plentiful in deeply herb-grown rather damp meadows between Lopollo and the river. Dec. 1859, Feb. 1860. No. **3836**.

The material under the following numbers is insufficient for specific determination:—

Zenza do Golungo.—A bulbous plant with habit of *Scilla* or *Urginea*. Flowers, almost entirely over, white-purplish. Arid hills with scanty shade between Calolo and Calumguembo. Sept. 1857. No. **3755**.

Mossamedes.—Several bulbs were collected, but lost during the rebellion of the Munani. Plentiful in sandy places by the sea between Mossamedes and Praia da Amelia. With split fr. Aug. 1859. No. **3841**.

Pungo Andongo.—A small bulbous herb with grassy radical leaves. Marsh pastures covered with short herbage at Mutollo at the foot of the Serra de Pedras de Guinga. Without fl., but with fr. and seed Jan. 1857. No. **3842**. A bulbous acaulescent plant 2 in. high, with

linear radical leaves ; seeds flattened. Mutollo, Jan. 1857. Coll. Carp. 1046.

Pungo Andongo.—Bulb large, tunicate, leaves linear, a foot long, channelled, suberect, scape branched. With scape and broken fruits, found in Tunda Quilombe on the præsidium Oct. 1856, subsequently bearing buds but no flowers in the garden at Golungo. No. **3845**.

Huilla.—A bulbous herb with no leaves and a fruit-bearing almost dead scape. End of Jan. 1860. No. **1049**.

17. **URGINEA** Steinh. ; Benth. & Hook. f. Gen. Pl. iii. p. 810.

Sect. 1.—Squilla.

1. **U. psilostachya** Welw. ex Baker in Trans. Linn. Soc. ser. 2. i. p. 247 (1878); Durand & Schinz, Consp. Fl. Afr. v. p. 383.

Cazengo.—Bulb ovate-conical, as big as a fist and sometimes larger, semi-epigæal, scales broadly ovate of web-like filaments as in *U. maritima*, concave, laxly imbricate, herbaceous-green. A number of bulbs, 12 to 15, old and young, are generally crowded together in small heaps. Leaves only properly developed after fruit is ripe, erect (very like those of *U. maritima*), 1 to 1½ ft., broadly linear, shortly acuminate, with a subulate mucro, succulent-coriaceous, rather rigid, bright green above, faintly transversely wrinkled, obtusely carinate below. Scape 3 to 4 ft., cylindrical, smooth, green, solid, springing with a tuft of leaves from the centre of the bulb, raceme 2 spans and longer, sometimes almost 2 ft. Bracts violet, a little way from the pedicel, with a saccate spur. Perianth-segments recurved, white, with a herbaceous-green basal nerve. Stamens thin or flattened subulate, anthers pale yellowish, cordate-oblong. Ovary conical, obscurely 6-angular, yellowish-green, ovules numerous horizontal. Style thick, triquetrous, whitish ; stigma obtusely trigonous, after pollination trifoliolate or trilobed. Dry thickets in sandy soil on the right of the river Luinha, bulbs and leaves Dec. 1854. Fl. August 1855. No. **3807**.

Pungo Andongo.—Leaves bifarious, arcuately spreading, thick, glaucous subobtuse. A bulb with leaves near Candumba March 1857, which afterwards flowered sparsely in Welwitsch's Golungo garden 4 August, 1857. A unique specimen. No. **3808**.

Sect. 2.—Albucopsis.

2. **U. comosa** Welw. ex Baker, *l.c.* ; Durand & Schinz, *l.c.*, p. 381.

Huilla.—A bulbous herb, with lorate broadly linear channelled acuminate leaves, and a glaucous scape 3 to 4 ft. long with a terminal raceme 1 to 1½ ft., scape cylindrical, axis of raceme channelled, polygonous. Flowers numerous, greenish, including the anthers. Filaments all flattened, gradually decreasing upwards from a broad base. Thicket-grown and wooded rather damp pastures on the Huilla plain between Lopollo and Monino. In fl. and fr. Dec. 1859 and Jan. 1860. No. **3815**. Wooded thicket-grown hills near Lopollo, Nov. 1859. Coll. Carp. 82.

Mossamedes.—Bulb very large, ovate, leaves 2 to 3 ft. long, 1¼ in. broad at the base, long-sheathing, appearing with the flowers. Scape 5 to 6 ft., ½ to 1 in. thick at the base. Raceme 1 to 1½ ft., ending in a dense conspicuous coma of sterile bracts. Perianth-segments oblong-linear, with an obtuse slightly hooded apex ; stamens shorter, erect, equal. Ovary obtusely trigonous, with truncate apex ; style firm white triquetrous, scarcely exceeding the stamens and crowned with an obtuse slightly papillose stigma. Capsule with 3 ventricose lobes

depressed and truncate above, seeds horizontal, concave, compressed, closely over-lapping downwards, black, shining. Sporadic in sandy places at the river Bero, near Cavalheiros. In fl. and fr. June 1859. No. **3814**. July 1859. COLL. CARP. 1026.

3. **U. chlorantha** Welw. ex Baker, *l.c.*, p. 248; Durand & Schinz, *l.c.*

LOANDA.—Bulb ovate, white below a few ash-coloured tunics, fleshy, with long fibres at the base. Leaves sheathing, equal in length to the scape, linear-lanceolate, acuminate, subflaccid, glaucous-green, striate, deeply channelled, very obtusely carinate, subcoriaceous, with dark green spots at the base. Scape 3 to $4\frac{1}{2}$ ft., central, enveloped at the base by the leaf-sheaths, raceme to $\frac{3}{4}$ ft., ending in a coma of greenish empty bracts. Pedicels bibracteate, lower ones sometimes unibracteate, outer bract acuminate from a broad half-sheathing base longer than the pedicel, the second inner or lateral, shorter, linear or more rarely very shortly ovate-acuminate, both greenish. In fruit the pedicels become much longer than the bracts. Perianth-segments herbaceous-green with a membranous-white edge, oblong, subequal, hooked at the tip, the outer 5-nerved, the inner 3-nerved, spreading-reflexed at maturity. Stamens equal, suberect, white, gradually acuminate from a broadly winged base. Pollen yellowish-white ; style and stigma whitish. Style straight, rather thick, obscurely trigonous, gradually becoming clavate towards the apex, stigma obtuse, finely papillose. Capsule trilobed almost to the axis, loculi turgid, oblong-ellipsoid, seeds horizontally flattened in 2 series. In sandy herbaceous shortly-grassed places, and among Mandioca plantations near Forte de Penedo behind Loanda, with fl. and unripe fr. end of Nov. 1857. Thicket-grown pastures near Penedo. In fl. and fr. end of Dec. 1857. No. **3810**. COLL. CARP. 1028. Sandy meadows in the littoral region Dec. 1858. COLL. CARP. 1030. Praia de Conceição near Loanda, Dec. 1858. COLL. CARP. 1031.

GOLUNGO ALTO.—An autumnal plant with greenish flowers. On once cultivated slopes between Sange and Bango. In fl. April 1855. No. **3812**. Bango, May 1856. COLL. CARP. 1033.

AMBACA.—1 to 2 ft., with the habit of *Ornithogalum* ; flowers greenish. In fr. Oct. 1856. COLL. CARP. 1032.

4. **U. cepæfolia** Welw. ms. in Herb.

*Ornithogalum cepæfolium* Baker, *l.c.* ; Durand & Schinz, *l.c.*

Resembles the last species in habit. Separated from *Ornithogalum* by the slightly perigynous stamens and flattened seeds with embryo nearly equal in length to the endosperm.

HUILLA.—1 to 2 ft. high ; stem scape-like sheathed by the leaves to the middle, leaves erect, green, resembling those of *Allium Cepa*, having the margins inrolled so that the leaf appears hollow ; flowers whitish-green, capsules obtusely trigastrous. Here and there in sunny herb-grown places on banks of streams near the river Monino and Lopollo, Dec. 1859. No. **3816**. A bulbous herb, stem leafy at the base, scape elongated, flowers not seen, Lopollo, Feb. 1860. COLL. CARP. 1027.

The following numbers, which are represented by material insufficient for certain determination, should probably be included in this species :—

PUNGO ANDONGO.—Flowers greenish. Sandy wooded places near

Cazella between Pungo Andongo and Zamba. Oct. 1856. No. **3817**. Thicket-grown meadows near Sansamanda. March 1857. No. **3818**.

Loanda.—Flowers greenish-white. Pastures near Penedo. Oct. 1857. Coll. Carp. 1029.

Material insufficient for specific determination.

Cazengo.—End of Sept. 1855. Coll. Carp. 1024. A single specimen with unripe fruit considered by Welwitsch to be a new species.

Pungo Andongo.—A bulbous herb with erect scape, 3 ft. long. Seeds flattened as in *Urginea*. Plentiful in damp meadows of thin grass near Muta Lucala. With ripe fr.; beginning of March 1857. No. **3809**.

Pungo Andongo.—Scape 2½ ft. Flowers greenish. Slopes of Serra de Pedras de Guinga. One specimen in fl. at the beginning of Jan. 1857. No. **3811**.

Loanda.—Resembles *Ornithogalum pyrenaicum*. Represa do Ricardo. Feb. 1854. Coll. Carp. 1034.

Mossamedes.—A bulbous plant, with scape 9 to 12 spans high and greenish flowers. Cavalheiros July 1859. Coll. Carp. 1025.

Perhaps *U. chlorantha* Welw., though much farther south than the present records for that species.

Zenza do Golungo.—Bulb ovate, large. Capsules winged triquetrous; seeds vertical, plano-compressed, black. Poor pastures between Calanguculo and Quicanda. In fr. Sept. 1857. No. **3813**.

Pungo Andongo.—Scantily grassed rocks of Tunda Quilombo. Without fl. Nov. 1856. No. **3824**.

## 18. **SCILLA** L.; Benth & Hook. f. Gen. Pl. iii. p. 814.

### Subgen. 1.—Euscilla.

1. **S. rigidifolia** Kth. Enum. iv. p. 330 (1843).

*S. hispidula* Baker in Trans. Linn. Soc. ser. 2. i. p. 248 (1878); Durand & Schinz, Consp. Fl. Afr. v. p. 392.

Huilla.—Bulbs large, solid, densely cæspitosely gregarious, yellowish, leaves rigid erect; flowers white. Sunny thicket-grown places on sandy-clayey soil near Banza de Lopollo. In fl. and fr. Nov. 1859. No. **3830**.

Baker places this next to his *S. firmifolia* in his arrangement of the genus (Journ. Linn. Soc. xiii. p. 237), but it is inseparable from the somewhat polymorphic *S. rigidifolia* Kth.

### Subgen. 2.—Ledebouria.

2. **S. benguellensis** Baker, *l.c.*, p. 249; Durand & Schinz, *l.c.*, p. 391.

Huilla.—Bulb large for the size of the plant; a social plant. Sunny rather sandy pastures near Lopollo. In fl. Nov. 1859. No. **3825**.

3. **S. polyphylla** Baker, *l.c.*; Durand & Schinz, *l.c.*, p. 397.

Pungo Andongo.—A small bulbous herb, with habit of *S. autumnalis* L., several radical, erect, linear, channelled, subobtuse or shortly acuminate, herbaceous-green leaves appearing with the flowers, scape cylindrical, subfleshy, erect, ending in a lax raceme. Pedicels arcuately spreading, violet and petaloid. Perianth campanulate, segments spreading rotately from the middle, deep violet-purple, ventricose at the base,

hooded at the apex. Stamens attached to the base of the segments, subulate, scarcely dilated at the base, purple, exserted owing to the wide spreading of the segments; anthers violet, pollen yellowish-green. Style filiform, somewhat arcuately deflexed; stigma subobtuse, papillosely capitellate. Rocky slopes of Tunda Quilombo on the præsidium. Sandy places near Candumba densely crowded over very wide areas; without fl. Jan. and March 1857. No. **3832**.

Golungo Alto.—Subsequently observed in fl., beginning of July 1857. No. **3833** (represented only by a sketch of a plant in flower).

4. **S. simiarum** Baker, *l.c.*; Durand & Schinz, *l.c.*, p. 398.
*S. arenaria* Baker, *l.c.*; Durand & Schinz, *l.c.*, p. 390.

Loanda.—Leaves glaucous-green prostrate, carinate, spotted with purple at the base, subfleshy. Scape more or less ascending, violet-green, purple-spotted at the base, terete. Flowers green-violet, spreading or even nodding, pedicels petaloid, hyaline-violet, with two shorter hyaline-whitish bracts. Filaments flattened, blue, anthers yellowish-green; style thick, subterete, a little shorter than the filaments, stigma very shortly papillate, rather flat. Unripe capsules deeply trilobed, lobes with a very obtuse rounded apex. Sandy places flooded in summer very dry in winter near Quicuxe. April 1854. No. **3821**.

Pungo Andongo.—Flowers lilac. Bulbs much liked by monkeys. Very plentiful in high rocky meadows on the south of the præsidium. In fl. and fr. Oct. 1856. No. **3822**. A small bulbous herb, all the leaves emerging from the top of the bulb erect-spreading, subglaucous-green and pubescent. Pedicels and flowers a beautiful violet. In great quantity, covering wide areas in sandy-wooded short-grassed pastures near Condo and Quitage. March 1857. No. **3823**.

No. 3823 is Baker's *S. arenaria*, but I cannot distinguish it from *S. simiarum*.

5. **S. flaccidula** Baker, *l.c.*; Durand & Schinz, *l.c.*, p. 392.

Pungo Andongo.—Bulb ovate, leaves linear-lanceolate, channelled, obtusely keeled, herbaceous-green, brightly shining. Raceme lax, pedicels petaloid, violet, very spreading, with distant bracteoles bidentate at the apex. Corolla herbaceous-green, segments rotately spreading, filaments deep purple, exserted; style arcuately declinate, purplish, papillately stigmatose at the apex. Thickets at the side of rocks near Pedra Pungo, in fr. Nov. 1856. Flowered at the beginning of July in garden at Golungo. No. **3820**.

6. **S. laxiflora** Baker, *l.c.*, p. 250, non Gard. Chron. ix. p. 668 (1891).

Loanda.—Bulb ovate-conical, scales dark, upwardly sheathing; leaves generally 3 or 4, lanceolate, subfleshy, and subrigid, almost orchidaceous, with dark purple spots on the upper face, narrowing gradually into a sheathing channelled petiole densely spotted with black or blood-red, spreading at flowering time, shorter than the scape. Scape cylindrical, a span and more, ascending with a gentle curve or almost suberect, branched at the apex, glabrous. Pedicels spreading widely when in flower, soon almost nodding, deep violet, with two basal bracteoles or one bipartite. Perianth herbaceous-green, segments campanulate below, spreading rotately from the middle, equal, broadly lanceolate, falling together loosely after pollination. Stamens inserted on the perianth-segments high above the base, long exserted; filaments equal, firm, straight, far exceeding the perianth. Style firm, white,

angled, longer than the stamens, moderately declinate or oblique, with a slightly subtruncate base. Ovary obtusely ovate, deeply 6-furrowed, ribs roundly convex, ventricose towards the base. On short-grassed hills round ponds in sandy clay near Quicuxe but somewhat rare. Bulbs with leaves found in May 1854 ; one specimen flowered under cultivation in garden at Loanda, Jan. 1858, after being kept dry till Nov. 1857. No. **3819**.

Baker subsequently described (Gard. Chron., *l.c.*), as a new species under the same name, a South African plant which flowered at Kew. Durand & Schinz have overlooked the original species founded on the Welwitsch material.

7. **S. platyphylla** Baker, *l.c.* ; Durand & Schinz, *l.c.*, p. 397.

Huilla. — Bulb large, ovately-spherical, solid, whitish inside. Flowers whitish-green. Thicket-grown hills, sparsely grassed, between Lopollo and Catumba. In fl. end of Dec. 1859. No. **3826**.

8. **S. congesta** Baker, *l.c.* ; Durand & Schinz, *l.c.*, p. 391.

Huilla. — Flowers whitish-green, without smell ; racemes very dense. Bulb proportionately very large, ovate-conical. Thicket-grown hillsides in the Lopollo district. In fl. beginning of Jan. 1860. No. **3827**.

9. **S. lanceæfolia** Baker in Saund. Refug. Bot. t. 182 (1870) ; in Trans. Linn. Soc., *l.c.* ; Durand & Schinz, *l.c.*, p. 393.

Huilla.—Flowers whitish-yellow-green. Sandy wooded pastures near Mumpulla. End of Oct. 1859. No. **3828**. Bulb as big as a walnut, solid, white, leaves subfleshy, with dark purple spots ; flowers purplish-lilac. Sunny hills with scanty thicket near Lopollo. Bulbs found Jan. 1860 ; flowered in the Lisbon garden May 1862. No. **3829**. A unique specimen.

The specimens under the following numbers may belong to this genus, but the material is insufficient for their determination :—

Pungo Andongo.—Bulbous, acaulescent, leaves radical, rosulate, spreading, lanceolate, concave, purple-spotted at the base. Bulb-scales dark-coloured, bulb compact. Habit of *Lachenalia*. Plentiful in thickets on the clay throughout the whole præsidium. Without fl. Dec. 1856. No. **3831**.

Golungo Alto.—Bulbous with two leaves. On slopes bearing short herbage of the Serra de Alto Queta growing with a species of *Hypoxis*. Without fl. Feb. 1856. (Two specimens cultivated in the Lisbon garden, 1861.) No. **3834**. A unique specimen.

Pungo Andongo.—A small plant, with a compact, white, fleshy succulent, round bulb, the size of a rather small walnut ; leaf solitary, radical, broadly cordate, with a subobtuse shortly hooded apex, thick and fleshy, stiff and brittle, at first involute and erect, but when fully developed closely appressed to the soil, rather glaucous-green. Scape central, an inch long, sheathed at the base by the leaf, straight, cylindrical, few-flowered. Flowers not well-developed but in every way resembling those of *Drimia acuminata*, but slightly smaller, short-stalked, open, lilac. Rather damp pastures in the edges of woods near the banks of the river Cuanza, near Calemba Is. Bulbs without fl. March 1857. Flowered in the Lumiar garden, but only sparsely. No. **3843**.

Mossamedes.—Sand-hills above Porto de Ponda. End of August 1859. No. **3844**.

19. **ORNITHOGALUM** L.; Benth. & Hook. f. Gen. Pl. iii. p. 815.

Sect. 1.—Beryllis.

1. **O. benguellense** Baker in Trans. Linn. Soc. ser. 2. i. p. 248 (1878); Durand & Schinz, Consp. Fl. Afr. v. p. 400.

Huilla.—A bulbous herb with purplish-white flowers. Perianth after maturity spirally twisting at the apex then falling like a calyptra. Ovules very few in the loculus. Near Lopollo Nov. 1859. Sandy thickets round Lopollo. In fl. and fr. Nov. 1859. No. **3766**.

The following numbers may belong to the genus, but in absence of flowers (and leaves) it is impossible to determine more exactly:—

Pungo Andongo.—A herb with a solid bulb white, densely fleshy and viscid inside. Leaves radical and, judging from their remains, linear. Remnants of flowers yellowish. In thickets with short herbage near Candumba, where it was found growing gregariously but with fl. and fr. already past. End of Jan. 1857. No. **3767**.

Pungo Andongo.—A herb with a solid bulb whitish inside and outside, with close fleshy scales, leaf radical, solitary, filiform, scape a foot long, erect, filiform, flowers in a long raceme. Rather rare on the tops of the rocks of Pedra Pungo. A few fruiting specimens Dec. 1857. No. **3765**.

20. **IPHIGENIA** Kunth; Benth. & Hook. f. Gen. Pl. iii., p. 824.

1. **I. guineensis** Baker in Journ. Linn. Soc. xvii. p. 451 (1879); Durand & Schinz, Consp. Fl. Afr. v. p. 415.

*Melanthium guineense* Welw. ex Baker, *l.c.*

Pungo Andongo.—Leaves linear-subulate deeply channelled up to the top, glaucous-green, subrigid. Perianth-segments a livid green outside, rose-violet within, stellately spread, deciduous. Stony pastures with short grass among the rocks of the præsidium, plentiful but not found in many places. In fl. 29 Oct. 1856. No. **1625**.

Huilla.—A slender herb a span long, bulb the size of a hazel-nut, of a compact white flesh inside, clothed with a few dark scales. Stem erect, angular, leafy, scarcely branched. Leaves alternate, the lower lanceolate-linear, the upper linear, channelled-triquetrous, long-acuminate, sheathing at the base, sheaths adhering for some distance to the stem. Perianth herbaceous-green beneath, greenish-purple above, segments quite distinct, sessile, linear-lanceolate with a somewhat narrowed base, stellately expanded, deciduous; stamens much shorter at the very base of the segments, filaments cylindric, rather thick, and stiff, purplish, erect-spreading; anthers extrorse; pollen deep yellow, plentiful. Ovary sessile obovate-globose, slightly triangular, many-ovuled; stigmas 3 subcylindric, shorter than the ovary, recurving, stigmatose on the inside, persistent adhering to the dehiscing valves. Capsule obovate-cylindric, very bluntly 3-angled, loculicidal. Seeds in two axile series in each loculus, angled-subglobose, dull-red; albumen plentiful, hard, fleshy or rather cartilaginous, including the central embryo. Rather rare in somewhat damp meadows on lake Ivantâla; somewhat plentiful on herbaceous thicket-grown slopes near the river of Lopollo. Flowers Feb. and March. With fruit and a few flowers March 1860. No. **1626**.

21. **GLORIOSA** L.; Benth. & Hook. f. Gen. Pl. iii. p. 830.

1. **G. superba** L. Sp. Pl. p. 305 (1753); Welw. Apont. p. 592; Baker in Journ. Linn. Soc. xvii. p. 457; Durand & Schinz, Consp. Fl. Afr. v. p. 417.

Sierra Leone.—Climbing to a height of 5 to 6 ft. Mountains behind Freetown, 1853. No. **1742**. A unique specimen.

Golungo Alto.—A herb sometimes erect, sometimes climbing on the higher grasses and on shrubs. Tuber smooth and whitish outside, 3-digitate, with numerous filiform fibres, stem 3 to 6 ft.; leaves 2 or 3, the lower alternate, the rest opposite, finely striately nerved, somewhat shiny above, paler beneath, upper ones tendril-bearing. Flowers at first green, then yellow, finally scarlet; two or three swollen hairy glands at base of segments. Native names "Dicumbelle," "Cumbelle." Wooded deeply herb-grown meadows on the river Quiapose near Sange. In fl. Nov. & Dec. 1854. No. **1743***a*. Thickets between Cambondo and the river Luinha. In fl. Jan., in fr. June 1855. No. **1743***b*. Tubers sent from Angola and flowered at Lisbon July 1862. No. **1743***c*. May 1856. Coll. Carp. 1039.

Pungo Andongo.—Wooded mountain-slopes of the præsidium near Mata de Cabondo; sporadic. In fl. Dec. 1856; flowerless stem April 1857. No. **1744**.

2. **G. simplex** L. Mant. p. 62 (1767).

*G. virescens* Lindl. Bot. Mag. t. 2539 (1825); Baker in Journ. Linn. Soc., *l.c.*, p. 458, in Trans. Linn. Soc. ser. 2. i. p. 262; Durand & Schinz, *l.c.*

Pungo Andongo.—An erect herb 1 to 1½ ft., densely leaved, scarcely branched, 2- to 5-flowered. Flowers blood-red even when in bud. Perianth-segments subequal, elliptical, with a narrow channelled base and long-acuminate apex, twice to thrice undulated in the middle, blood-red inside and out except for some lateral sulphur-coloured bands at the base. Flowers a little smaller than in *G. superba*, with proportionately broader, more markedly striate leaves showing only a tendency to become cirrhose; root-tubers as in *G. superba*. Woody thickets on the præsidium near Catete, but rare. In fl. beginning of Dec. 1856. No. **1745**. Flowers a pale copper-green when alive, reddening in drying. In fl. end of Nov. 1857. No. **1745***b*. In fr. only in rather dry thickets near the banks of the river Cuanza near Sansamanda, 7 Feb. 1857. Coll. Carp. 1040.

Huilla.—Never climbing. Flowers blood-red from the first; petals very slightly or scarcely at all undulate; peduncles extra-axillary. Deep-grassed wooded meadows on the banks of the river Monino, growing with *Epilobium*, *Salix*, and *Faurea*. In fl. beginning of March 1860. No. **1746**. Sporadic on wooded rather damp slopes across Lake Ivantâla near the road to Quilengues. In fl. Feb. 1860. No. **1746***b*. The loveliest queen of tropical African Liliaceæ. In fr. on the river Monino. End of April 1860. Coll. Carp. 63.

22. **LITTONIA** Hook.; Benth. & Hook. f. Gen. Pl. iii. p. 831.

1. **L. Welwitschii** Benth. & Hook. f., *l.c.*

*Sandersonia littonioides* Welw. ex Baker in Trans. Linn. Soc. ser. 2. i. p. 262 (1878); Journ. Linn. Soc. xvii. p. 453; Durand & Schinz, Consp. Fl. Afr. v. p. 418.

Pungo Andongo.—A glaucous-green herb with fleshy tuberous root, erect leafy stem 1½ ft., subacutely many-angled, tough and firm, in the taller specimens flexuose towards the apex as if intending to climb. Leaves alternate, lanceolate, sheathing, slightly coriaceous, rigidulous, lower ones pungent, upper with resinous dots on the upper surface between the nerves, acuminate tending to cirrhose, as in *Gloriosa*. Peduncles axillary, ebracteate, spreading, 6-angled, 1 to 2 in. long. Flowers nodding, orange-purple with dark purple spots. Perianth marcescent-persistent, segments subequal, campanulately spreading, acute, with a broad saccate basal nectary. Stamens flat, tapering from a broader base, anthers large, versatile. Ovary oblong, obtuse, trigibbous, deeply trisulcate. Style straight from a central pit, bearing at the top 3 recurved stigmas. Rather open sandy damp woods by streams near Cazella, but in a few places only. In fl. and unripe fr. Jan. 1857. Nos. **1747, 1748.**

23. **WALLERIA** Kirk; Benth. & Hook. f. Gen. Pl. iii. p. 831.

1. **W. Mackenzii** Kirk in Trans. Linn. Soc. xxiv. p. 497, t. 52, fig. 2 (1864); Baker in Journ. Linn. Soc. xvii. p. 499 (1879).

*W. angolensis* Baker in Trans. Linn. Soc. ser. 2. i. p. 263 (1878); Durand & Schinz, Consp. Fl. Afr. v. p. 418.

Huilla.—A herb 1 to 2 ft. high with habit of *Convallaria verticillata*, with tuberous-digitate whitish fleshy roots. Stems erect, leafy to the top, acutely angled by the decurrent leaf-keels. Leaves semi-amplexicaul, lanceolate, subglaucous, subtrinerved, and slightly fleshy. Peduncles axillary, erect-nodding, simple, rarely forked. Flowers pale azure, suberect, afterwards spreading or somewhat nodding; perianth-segments elliptic-lanceolate, erect, subobtuse and subfleshy. Anthers long, pyramidately 4-angled, yellow, loculi dehiscing by a rounded apical aperture. Ovary ovate, with a central filiform style and slightly papillose stigma. Here and there in short thicket-grown sandy-clayey somewhat rocky pastures, near Lopollo along with *Guidia*, *Ascolepis* and species of *Euphorbia*; flowering in the rainy season. In fl. Nov., in fl. and unripe fr. Dec. 1859. No. **1749.**

In the absence of adequate material, determination of the following is impossible:—

**Melanthaceæ** Gen. and sp. nov. Welw. ms.

Huilla.—A slender bulbous herb a span high, with narrow-linear channelled sheathing leaves, sheaths long; peduncles subaxillary, capsules trigonous. Stigmas three, arcuately spreading. Marshy places on the river near Lopollo. In fr. 26 March 1860. Coll. Carp. 1050. Represented only by a few seeds.

## XII. PONTEDERIACEÆ.

1. **EICHORNIA** Kunth; Benth. & Hook. f. Gen. Pl. iii. p. 838.

1. **E. natans** Solms-Laub. in Abh. nat. Ver. Brem. vii. p. 254 (1882), in DC. Mon. Phan. iv. p. 526 (1883); Durand & Schinz, Consp. Fl. Afr. v. p. 418.

Loanda.—Lagôa de Quifandongo, Dec. 1853. No. **3014.** Subsequently looked for in vain.

2. **HETERANTHERA** Ruiz & Pavon; Benth. & Hook. f. Gen. Pl. iii. p. 838.

1. **H.** sp.

Cazengo.—A lacustrine plant with habit of *Alisma* or *Sagittaria* laxly rooting in watery mud, acaulescent, scapigerous, with swimming subpeltate leaves, petioles very long, septate. Margins of Lagôa de Moambege near Dalatando. Flowers almost over, June 1855. No. **3015**.

Perhaps a new species of the genus; but in the absence of flowers it is impossible to say. The leaves are more or less orbicular with a cordate base.

3. **MONOCHORIA** Presl; Benth. & Hook. f. Gen. Pl. iii. p. 839.

1. **M. vaginalis** Presl, Reliq. Hænk. i. p. 128 (1827); Solms-Laub. in DC. Mon. Phan. iv. p. 524 (1883).

Pungo Andongo.—A perennial herb growing in marshes, with membranous, green, swimming leaves. Ponds near Banza de Quitage. Without fl. March 1857. No. **3013**.

Indistinguishable from the type, which has hitherto not been recorded from Africa.

## XIII. XYRIDEÆ.

1. **XYRIS** L.; Benth. & Hook. f. Gen. Pl. iii. p. 842.

1. **X. Umbilonis** Nilss. in K. Svensk. Vet. Akad. Handb. xxiv. No. 14, p. 30 (1892); Durand & Schinz, Consp. Fl. Afr. v. p. 421.

Pungo Andongo.—A perennial widely cæspitose herb, 2 to 2½ ft. high; stem and leaves glaucous, rigidulous; flower-spikes ovoid-cylindrical, dark-brown, flowers yellow. Damp meadows by the banks of the Cuanza near Bumba. In fl. and fr. March 1857. No. **2460**.

Huilla.—Spongy marshes at the foot of Serra de Oiahoia, Humpata. Towards the end of April 1860. No. **2475**.

The Angolan specimens differ from the South African in their slightly narrower sepals and the greater extent of the non-polished area in the upper half of the bract, but the differences are insufficient for specific distinction.

2. **X. rigidescens** Welw. ms. in herb.

Glabrous, leaves rigid, flattened, linear, tapering rapidly above to the shortly pungent apex, sheath very broad and reddish-brown below, narrowing upwards; peduncles far exceeding the leaves, compressed, sheath broadly linear, reddish-brown to the middle, leafless, ending abruptly in a sharp stiff apiculus; spikes subglobose; lower bracts very tough and leathery, orbicular to very broadly oblong, concave, becoming keeled below the strongly apiculate apex, dirty brown with thinner straw-coloured entire edges, upper half with a circular submuriculate area; becoming broadly ovate, less rigid and less deeply coloured above; shorter than the lateral sepals which are suboblong when opened out, with sides of a pale straw-colour passing into the dark brown keel which is shortly ciliate up to the base of the strong apiculus; flowers withered, corolla-segments apparently oblong, staminodes 2-armed densely pilose, shorter than the stamens, anthers broadly linear; unripe fruit compressed, broadly oval.

Leaves 7 to 10 in. long including the sheath (1½ to 2¼ in.), scarcely 1 to 1⅔ lines broad; peduncles reaching 30 in.; sheath 3 to 6 in. Spikes 4 to 6 lines each way; lower bracts about 3 lines long by 1⅔ to 2 lines broad; lateral sepals 3¼ lines; unripe fr. scarcely 1½ line.

Near *X. Rehmanni* Nilss. (Transvaal), but distinguished by its more strongly mucronate sepals with keels ciliate to the base of the mucro; it is also a stronger more rigid plant.

Huilla.—Plentiful in spongy places near streams round Lopollo, growing with species of *Aroides* and *Gladiolus*. In fl. and fr. Dec. 1859. No. **2474**.

3. **X. Welwitschii** Rendle sp. nov.

Leaves very narrowly ensiform or linear above the plicate bases and sheath, acute, submembranous, margin and sometimes faces scabrid; peduncles slender, wiry, 2 to 3 times the length of the leaves, with scabrid longitudinal ridges and a leaf-like sheath ½ to ⅓ its length; spikes pale brown, ellipsoidal when young, hemispherical when mature; bracts coriaceous becoming somewhat scarious near the broad entire margins, 3-nerved, the lowest broadly ovate, becoming oval to obovate above; lateral sepals slightly protruding, spathulately oblanceolate, blunt, keel minutely hispidulous from the middle to near the apex, pale straw-coloured, odd sepal crimson; corolla yellow; anthers large, linear-oblong, exceeding the shortly tufted pilose staminodes; capsule obovately elliptical, seeds dull black, ellipsoidal with minutely umbonate ends and well-marked longitudinal ridges united by inconspicuous transverse ladder-like markings.

Leaves 3 to 6 in. long, 1 line or a little less in breadth; peduncles to 14 in. long, ⅓ to ½ line thick; spikes about 4 lines long by 2½ to 4½ in diameter. Bracts 2 to 3 lines long by 1¾ to 2½ broad; sepals a little over 3 lines long, 1⅔ to 1¾ line broad when folded; anthers scarcely 1 line long. Capsule 2½ lines long.

Near *X. straminea* Nilss., but distinguished by its larger spikes and flowers, and sculptured dull black seeds.

Huilla.—Wooded marshy meadows between Lopollo and Monino. Beginning of April 1860. No. **2465**.

4. **X. capensis** Thunb. Prodr. Pl. Capens. p. 12 (1794); Nilss., *l.c.*; Durand & Schinz, *l.c.*, p. 420.

Huilla.—Habit exactly like some capitate species of *Juncus*. Leaves flat, narrowly linear, green, culms strict, deeply furrowed, twice as long. Flowers rather small, yellow. Boggy places near the banks of the river of Mumpulla. In fl. and fr. Oct. 1859. No. **2473**.

5. **X. reptans** Rendle sp. nov.

Cæspitose, spreading by a slender rhizome clothed with root-fibres and fibrous remains of leaf-sheaths; leaves linear, tapering to a blunt apex and narrowing below to the long, green, pale, scarious-margined sheath, glabrous but like the slender flattened peduncle striolate, peduncle a little longer than the leaves, enclosed for a quarter of its length in a flattened sheath

which bears only a short stiff apiculus; spikes several-flowered; bracts membranous, dirty brown, the lowest broadly ovate with a median keel ending in a blunt apiculus, becoming orbicular, through elliptical, to obovate with gradual disappearance of the keel upwards; lateral sepals when opened elliptical, emarginate with a small central mucro, sides subequal, pale brown, becoming translucent and almost colourless towards the margin and deeper towards the glabrous keel; fruit trigonous, obpyramidal with a rounded rostrate apex, containing a few perfect reddish-brown obovate seeds in the upper part and numerous aborted seeds on the three parietal placentas; testa marked by fine ridges into longitudinal rows of rectangular areas.

Leaves 3 to 8 in. long by $\frac{1}{3}$ to $\frac{2}{3}$ line broad, peduncle $8\frac{1}{2}$ in. long, barely $\frac{1}{2}$ line wide, sheath $1\frac{3}{4}$ in., apiculus 1 line. Spike (broken) about $2\frac{1}{2}$ lines long by 3 lines broad. Bracts 1 to $1\frac{1}{2}$ lines by about 1 line; lateral sepals $1\frac{1}{2}$ line by $\frac{1}{2}$ line; fruit 1 line long.

Described from a single specimen bearing fruit only. Apparently near *X. capensis*, but distinguished by its flattened peduncle and smaller elliptical sepals.

Huilla.—Leaves rigidulous, not fenestrate; peduncles thin, erect. Near the chief stream of Morro de Lopollo, where at the end of November 1859 two sparsely fruiting tufts were seen, but afterwards sought in vain. Apparently liked by cattle. No. **2459**.

6. **X. nivea** Welw. ms. in herb.

Glabrous, cæspitose, base slightly bulbous, root-fibres very slender and flexuose; leaves stiff, erect, filiform-subulate, flexuose from a short sheath, about half the length of the slender, flexuose, wiry, subterete, faintly angled peduncle; peduncular sheath short, leafless, ending in a short stiff awn; spikes few-flowered, subglobose with a somewhat flattened top; bracts broadly elliptical to broadly obovate, very obtuse, coriaceous, 3-nerved, entire, a rather dull brown with stramineous scarious easily broken margins; lateral sepals rather broadly falcately navicular, blunt, obovate when opened out, keel pale brown, scabridulous except near the base; corolla a splendid white, lobes obovate-elliptical, concave, margin finely plicate-denticulate; stamens exceeding the pilose staminodes; style tripartite to the middle; ovary subobovate becoming markedly obovate as it ripens; seeds pointed elliptical, red.

Leaves 3 to 5 in. long including sheath ($\frac{1}{2}$ to 1 in.) by about $\frac{1}{4}$ line in diameter. Peduncles a span to scarcely a foot, sheath $1\frac{1}{2}$ to $1\frac{3}{4}$ in. long, spikes $2\frac{1}{2}$ to 3 lines long and about as broad. Bracts $1\frac{1}{2}$ to 2 lines long by $1\frac{1}{4}$ to $1\frac{3}{4}$ broad. Lateral sepals 2 lines by a little over $\frac{1}{2}$ line when folded; odd sepal crimson above. Anthers $\frac{2}{3}$ line, filament $\frac{1}{3}$ line, together about half the length of the petal.

A distinct species recognised at once by its slender wiry peduncles and stiff filiform leaves.

HUILLA.—Sunny wooded places (not or scarcely damp) between Lopollo and Monino, growing with species of *Protea* and *Gladiolus*. Feb. 1860. No. **2468**.

7. **X. affinis** Welw. ms. in herb.

Widely cæspitose; habit of *X. nivea* but leaves flattened, narrowly linear acute from a broader sheath; sheaths of withered leaves persistent, dark brown with brown, hairy margins; peduncle erect slender subcompressed; spikes few (5 or 6) flowered, ellipsoidal to obovoid when young becoming subglobose with a somewhat flattened top when ripe; bracts more or less broadly bluntly elliptical sometimes tending to obovate, 3-nerved, entire, dark brown with lighter subscarious margins; lateral sepals narrower than in *X. nivea*, oblanceolate, keel narrowly winged for $\frac{4}{5}$ the length from the base and scabridulous above the base; corolla yellow, lobes obovate, stamens slightly exceeding the short deep yellow 2-armed pilose staminodes; anthers orange in bud; ovary ellipsoid becoming oblanceolate as it ripens; seeds (unripe) as in *X. nivea*.

Leaves 3 to $4\frac{1}{2}$ in. long including sheath (1 in. or less), $\frac{1}{3}$ to $\frac{4}{5}$ line broad. Peduncles 9 to 10 in. long, $\frac{1}{4}$ to $\frac{1}{3}$ line broad, sheath leafless, minutely apiculate, $2\frac{1}{4}$ to 3 in long; spikes $2\frac{1}{2}$ to 3 lines long and nearly as broad. Bracts $1\frac{1}{2}$ to little over 2 lines long by little over 1 to nearly 2 lines broad. Sepals 2 lines by $\frac{1}{2}$ line; anthers 1 line by scarcely $\frac{1}{2}$ line. Fruit (unripe) $1\frac{3}{4}$ by $\frac{4}{5}$ line broad near the apex, which is beaked with the persistent base of the style.

Near *X. nivea* but distinguished by its flat leaves, yellow flowers and narrower more prominently keeled lateral sepals.

HUILLA.—Resembling *X. nivea* in habit but distinguished besides other characters by its constantly yellow flowers, angled less tortuose peduncle, and shorter flattened green not glaucous leaves. Elevated damp meadows on Morro de Monino at 5000 feet. Beginning of April 1860. No. **2467**.

8. **X. pumila** Rendle sp. nov.

Small with stiff habit, the hard woody cylindrical main stem bearing several crowded regularly distichous-leaved branches; persistent sheathing bases of old leaves chestnut-brown, new leaves glabrous, flattened, linear, passing above into a very acute or subaristate apex, and below into the stiff dry upwardly tapering chestnut-brown sheath; peduncles rigid, erect, terete, glabrous, exceeding the leaves, spikes few- (3-) flowered, narrowly ellipsoidal slightly drawn out at the base; bracts dark chesnut-brown with paler entire margin, outer exposed surface finely muriculate, coriaceous, the lowest subovately elliptical with a pair of lateral nerves meeting the median about $\frac{1}{3}$ below the blunt apex, back slightly keeled below the apex, the upper becoming elliptical to suborbicular and very concave above with the two lateral veins converging nearer the apex; lateral sepals lanceolate, blunt, with a brown dorsal keel more or less scabridulous from about $\frac{1}{2}$ above the base to the apex, sides paler unequal, posterior sepal orange-crimson, narrowly ellipsoidal; corolla bright yellow, anthers in

bud orange-yellow, linear-oblong, exceeding the 2-armed hairy staminodes. The rather stout root-fibres stain the paper on which they are mounted a pale crimson.

The new leaves which are shooting out above the closely sheathing bases of last season reach $3\frac{1}{2}$ in. long including the sheath ($\frac{3}{4}$ in.) by barely $\frac{1}{2}$ line broad. Peduncles to 5 in. long by a little over $\frac{1}{4}$ line thick, spike $2\frac{1}{4}$ to $2\frac{1}{2}$ by 1 to $1\frac{1}{2}$ lines. Bracts $1\frac{2}{3}$ to 2 by $\frac{3}{4}$ to $1\frac{1}{2}$ lines; sepals about 2 lines long by between $\frac{1}{3}$ and $\frac{1}{2}$ line broad. Anthers $\frac{2}{3}$ line long in bud.

Comes perhaps nearest to *X. affinis* but is distinguished by its smaller size, very rigid habit, crowded regularly distichous shoots, terete scape, and smaller spikes.

Huilla.—Short thicket-grown marshes between Humpata and the lofty plain of Empalanca. In fl. April 1860. No. **2471**.

9. **X. huillensis** Rendle sp. nov.

Glabrous, cæspitose, with a rush-like habit; leaves short, flat, narrow linear, acute, sheath broadening downwards, membranous, faintly tinged with red with a hyaline margin; peduncle filiform, subcompressed, reddish below, many times longer than the leaves, sheath apiculate, about as long as the leaves; spikes truncated, ellipsoid when young becoming hemispherical, few-flowered (about 6), bracts entire, bright brown, ovate, bluntly carinate in the upper half, very blunt or with a shortly mucronate apex, becoming narrower and concave above, 3-nerved sometimes incompletely; lateral sepals oblanceolate, blunt, brown, keel pale and transparent, narrow, extending for two-thirds from the base, glabrous; corolla yellow, limbs obovate; stamens longer than the bright yellow densely pilose staminodes, anther subsagittate, ovary compressed ellipsoidal becoming obovoid as it ripens and shortly rostrate, style 3-partite to the middle; seeds on three parietal placentas, elliptical narrowing to a slight umbo at each end, crimson with dark longitudinal lines, glabrous.

Leaves $\frac{3}{4}$ to $2\frac{1}{2}$ in. by $\frac{1}{4}$ to $\frac{1}{2}$ line broad; peduncles 3 to 12 in. by $\frac{1}{3}$ line or less, spikes when fully developed about 2 lines long and broad. Bracts $1\frac{1}{3}$ to $1\frac{3}{4}$ by $\frac{2}{3}$ to 1 line; lateral sepals $1\frac{1}{2}$ to $1\frac{3}{4}$ by about $\frac{1}{2}$ line broad when folded; petals $1\frac{1}{3}$ by $\frac{3}{4}$ line. Stamens 1 line, anthers a little longer than the filament. Ovary 1 line.

Near *X. straminea* Nilss. but a smaller plant with shorter narrower leaves and brown not straw-coloured spikes.

Huilla.—Flowers constantly yellow. Empalanca, in lofty sandy pastures bearing short herbage and flooded in the rainy season. Feb. and April 1860. No. **2469**. Marshes near the river Quipumpunhinc in the Humpata district between Nene and Humpata. In fl. and fr. end of May 1860. No. **2472**.

10. **X. fugaciflora** Rendle sp. nov.

Glabrous, cæspitose, leaves narrow-linear, acute, rugulose with scabridulous margin, especially the older ones; peduncles flattened very slender, sheaths with a short leaf-like appendage; spikes 4- to 5-flowered, ellipsoidal with narrowing ends in flower,

becoming semi-ellipsoidal after flowering, bracts reddish-brown becoming paler at the entire margin, membranous, 3-nerved, the lower ones ovate and apiculate passing upwards through elliptical to broadly obovate and orbicular-obovate and very blunt; lateral sepals lanceolate, blunt, with subequal sides, pale and transparent, with faintly keeled pale greenish-reddish-brown glabrous back; corolla yellow, very fugacious, lobes obovate with denticulate outer edge; staminodes 2-armed forming a dense tangle as long as the stamens, anthers broadly oblong; ovary oblanceolate, shortly beaked, seeds reddish-brown, ellipsoidal, longitudinally striate, with a prominent light-coloured apical umbo.

Leaves less than $\frac{1}{2}$ in. to 4 in. long by $\frac{1}{5}$ to $\frac{1}{2}$ line broad; peduncles 3 to 9 in. long, $\frac{1}{6}$ to $\frac{1}{4}$ line broad, sheaths $\frac{1}{2}$ to 2 in., with leaf-like appendage $1\frac{1}{4}$ to 3 lines long. Spikes $1\frac{2}{3}$ to $2\frac{1}{4}$ lines long by 1 to barely 2 lines; bracts $1\frac{1}{3}$ to 2 by $\frac{2}{3}$ to $1\frac{1}{2}$ line; lateral sepals 2 lines or barely 2 lines by barely $\frac{1}{2}$ line; corolla lobe barely 2 lines long; stamens about $1\frac{1}{3}$ to $1\frac{1}{4}$ line long, anthers $\frac{2}{3}$ to $\frac{3}{4}$ line; ovary $1\frac{1}{3}$ line.

Near *X. huillensis* but a more delicate plant, with spikes pointed when in flower, and more membranous reddish-brown bracts.

Pungo Andongo.—Spongy places between Caghuy and Sansamanda but somewhat rare, 1 May, 1857. No. **2461**. A dwarf plant in spongy wooded meadows at Mutollo near Pedras de Guinga along with dwarf Iridæ (*Ferraria andongensis*) and *Scleria*. In fl. Jan. 1857. No. **2462**. Plentiful in spongy places on the higher rocks of Catete right on the præsidium. In fl. but no fr. April 1857. No. **2464**.

11. **X. scabridula** Rendle sp. nov.

Habit of *X. huillensis* but less rush-like. leaves markedly rugulose with scabridulous margin and markedly striate scapes; spikes few-flowered (4-or more) slightly larger than in *X. huillensis*, bracts more membranous, orbicular-obovate to suborbicular, very blunt, sometimes with a small subapical mucro, with paler entire margins; lateral sepals oblanceolate, keel sparsely hispidulous in the middle third; corolla intensely yellow, lobes obovate, stamens exceeding the hairy 2-armed staminodes; ovary oblanceolate, seeds ellipsoid, umbonate at one or both ends, crimson, almost smooth.

Leaves $\frac{1}{2}$ to $2\frac{1}{2}$ in. by $\frac{1}{6}$ to $\frac{1}{2}$ line; scapes 2 to $6\frac{1}{2}$ in.; spikes $1\frac{1}{3}$ to 3 lines long by $\frac{2}{3}$ to 3 lines. Bracts $1\frac{1}{2}$ to $1\frac{2}{3}$ by $1\frac{1}{4}$ to $1\frac{1}{2}$ lines. Lateral sepals $1\frac{3}{4}$ to 2 lines by $\frac{1}{2}$ line, corolla-lobes a little over 1 line by scarcely $\frac{2}{3}$ line; anthers (in bud) $\frac{3}{4}$ line long and half as broad; ovary $1\frac{1}{4}$ line long.

Huilla.—Culms very slender, flowers intensely yellow. Elevated short thicket-grown sandy meadows, sometimes flooded in summer, of the Serra de Oiahoia behind Humpata; April 1860. No. **2470**.

12. **X. anisophylla** Welw. ms. in herb.

Closely resembling *X. scabridula* in habit but more robust with broader leaves; spikes 5-flowered, truncate-ellipsoid often becoming hemispherical when mature; bracts membranous, pale reddish-brown, with broad transparent stramineous margins, 3-nerved, orbicular-obovate to broadly oval, very blunt, sometimes

faintly keeled in the upper part; lateral sepals transparent, tinged with pale reddish-brown along the dorsal line, sides very unequal, narrowly keeled for $\frac{2}{3}$ from base, keel glabrous, obovate when opened, very blunt; corolla yellow, petals oblong (?); anthers oblong with cordate base, staminodes 2-armed breaking up into a dense yellow hairy tangle rather more than half the length of the stamen; style 3-partite to the middle; fruit plano-convex, narrowly obovoid, very shortly beaked; seeds ellipsoid with an apical umbo, red, longitudinally marked with strong spiral ridges.

Leaves reaching 3 in. long by nearly 1 line broad, scapes 5 to $8\frac{1}{2}$ in., sheaths $1\frac{1}{2}$ to nearly 2 in., acute. Spikes 2 by $1\frac{1}{2}$ to $2\frac{1}{2}$ lines. Bracts 2 lines long or rather less; lateral sepals $1\frac{1}{2}$ to $1\frac{3}{4}$ lines, by scarcely $\frac{1}{2}$ line broad. Petals $1\frac{1}{2}$ line long or more (the top was always torn) by scarcely 1 line broad; anthers scarcely $\frac{3}{4}$ line by $\frac{3}{8}$ line broad slightly exceeding the short filament. Fruit scarcely $1\frac{1}{2}$ line long.

Very near *X. scabridula* Rendle, but distinguished by the slightly shorter glabrous keeled delicate lateral sepals and the spirally ridged seeds; the bracts are also more membranous.

Pungo Andongo.—Culms of a shining copper or almost gold colour from above the base to the middle, twisting on drying. Spongy places near huge rocks at Barrancos de Catete growing with species of *Ascolepis* right on the præsidium. In fl. and fr. May 1857. No. **2463**.

*Note*.—These spongy places are produced chiefly through an Alga with the help of but very few mosses.

13. **X. erubescens** Rendle sp. nov.

Bulbous, outer scales coriaceous to scarious, long-acuminate from a broad base, dull shining brown; scapes springing from the midst of the persistent bases of last season's leaves, green, subrigid, flexuose, subquadrangular, glabrous, sheath rather loose above and passing into a weak point; spike ellipsoidal to subglobose; bracts a dirty yellowish-brown with pale entire margin, coriaceous, lowermost oblong, then orbicular and very concave, shortly apiculate or apex often broken and retuse, 7-9-nerved; lateral sepals narrow, falcate, sides very unequal, keel very strong, greenish-brown below, becoming crimson above, minutely hispidulous from about the middle to the apex; anthers (in bud) oblong and orange-coloured, staminodes 2-armed forming a long narrow tuft of hairs exceeding the anthers.

Plants about 8 in. high, with a small fleshy bulb about $\frac{1}{3}$ in. in diameter, leafless, peduncles $5\frac{1}{2}$ to 8 in. long, sheaths about 2 in. Bracts 2 to 3 lines long by $1\frac{1}{2}$ to $2\frac{1}{2}$ broad. Lateral sepals $2\frac{1}{4}$ to $2\frac{1}{3}$ lines by $\frac{1}{2}$ line or barely $\frac{1}{2}$ line when folded, the narrower side less than half the width of the broader; stamens (in bud) 1 line, anthers $\frac{4}{5}$ line; ovules numerous on 3 parietal placentas.

Recalls *X. pauciflora* Willd. in external appearance of spike, but differs widely in sepal characters.

Huilla.—Here and there in marshy pastures with short herbage near Nene by the road towards Lopollo. In fr. Oct. 1859. No. **2466**.

## XIV. COMMELINACEÆ.

**1. POLLIA** Thunb.; Benth. & Hook. f. Gen. Pl. iii. p. 846.

**1. P. Mannii** C. B. Clarke in DC. Mon. Phan. iii. p. 124 (1881); Durand & Schinz, Consp. Fl. Afr. v. p. 421.

Cazengo.—An erect herb, 2 to 3 ft. high. Flowers not seen; fruit a deep shining metallic blue. Lofty woods of Muxaûlo, but not plentiful. Ripe fr. middle of June 1855. No. **6604** (in part).

**2. P. condensata** C. B. Clarke, *l.c.*; Durand & Schinz, *l.c.*

Cazengo.—An erect herb 2 to 3 ft. high. Flowers not seen; fruit a deep shining metallic blue. Lofty woods of Muxaûlo, but not plentiful. In ripe fr. middle of June 1855. No. **6604** (in part).

**2. PALISOTA** Reichenb.; Benth. & Hook. f. Gen. Pl. iii. p. 847.

**1. P. Schweinfurthii** C. B. Clarke in DC. Mon. Phan. iii. p. 132 (1881); Durand & Schinz, Consp. Fl. Afr. v. p. 422.

Island of St. Thomas.—A perennial almost frutescent herb, 4 to 6 ft. high; stem fleshy, branched, leafy chiefly at the top; flowers white; berries scarlet, as big as a pea, soft, slightly succulent, indehiscent, each of the three loculi 2-, 3-, more rarely 4-seeded. Seeds thick, peltate, many furrowed. Plentiful in the more lofty thick woods of Fazenda do Monte Caffè. In fl. and fr. Dec. 1860. No. **6602**. At about 2000 ft. high, in the more lofty primitive woods. Dec. and Jan. 1861. Coll. Carp. 1043.

Golungo Alto.—A perennial herb, stem 3 to 7, more rarely 9 ft., succulent, leaves arranged in a palmiform way at the top of the stem. Flowers dull violet. Berries pea-like, scarlet. On banks of streams in the deep shade of primitive woods, always growing with Scitamineæ and Piperaceæ. In fl. Dec. 1855; in fr. Feb. 1856. Quilombo-Quiacatubia Feb. 1855. No. **6599**. No. **6603***b* (no notes). A fine plant; stem 6 to 9 ft., or sometimes higher, 1½ in. thick at the base, solid, juicy. Berries scarlet, 3- to 6-seeded, as big as a pea. Mata de Quisuculo, 28 April 1856, and June 1857. Coll. Carp. 126.

Pungo Andongo.—Flowers white, otherwise does not seem different from the species collected in Golungo Alto. Shady valleys between the higher rocks. In fl. Jan. 1857. No. **6603**.

**3. COMMELINA** L.; Benth. & Hook. f. Gen. Pl. iii. p. 847.

**1. C. nudiflora** L. Sp. Pl. i. p. 41 (1753); C. B. Clarke in DC. Mon. Phan. iii. p. 144 (1881); Durand & Schinz, Consp. Fl. Afr. v. p. 427.

Congo.—Bright green, sublucent, with deep blue flowers, and procumbent stems rooting freely at the nodes. By streams between Ambriz and Mosul and at Quilombo de Mosul. End of Nov. 1853. No. **6623**.

Icolo e Bengo. — An annual decumbent herb with ascending branches; flowers rather small, blue. Sheaths smooth. Wet places by the river Bengo near S Antonio. In fl. Dec. 1853. No. **6617**. An annual or in damp places sometimes perennial herb, with prostrate elongated stems, often rooting at the nodes, sometimes ascending-erect among herbs or shrubs. Flowers plentiful, deep dark blue or sky-blue,

fugacious. Leaf-sheaths long-ciliate. Short thicket-grown damp rather sandy places by the larger lake of Quilunda, near Prata. Sept. 1857. No. **6619.**

Golungo Alto.—A low herb with long creeping stoloniferous stem and numerous pale blue flowers, flowering almost the whole year on dry and damp sunny and shady slopes. A most noxious weed in fields, especially where *Arachis* is sown. Almost everywhere except in primitive woods. Damp shady places by the river Congo near Canguerasange, Oct. 1854, and in fl. and fr. Zengas do Queta March 1856. No. **6609.**

Mossamedes.—An annual or biennial herb, widely cæspitose, with runners and very long stolons, flowers a rather deep blue. Called by the negroes Quindagala ; cooked with seeds of a *Phaseolus*, and eagerly devoured by them. Plentiful on the damp sandy rocks of the river Bero. In fl. Aug. 1859. No. **6580.**

Var. **Werneana** C. B. Clarke, *l.c.*, p. 145 ; Durand & Schinz, *l.c.*

Sierra Leone.—Damp thicket by cataracts on Sugar-loaf mountains. Sept. 1853. Nos. **6625**, **6625***b*.

Golungo Alto.—Sange No. **6606**. Plentiful in damp reedy (Capim) places and on the banks of the river Quiapoze ; beginning of June 1855. Varzea d'Isidre Sept. 1855. No. **6608.**

2. **C. scandens** Welw. ex C. B. Clarke, *l.c.*, p. 146 ; Durand & Schinz, *l.c.*, p. 428.

Pungo Andongo.—A herb 5 to 10 ft. long ; flowers deep blue. Leaves and especially the sheaths glaucescent. Among reeds on the banks of the Cuanza, near N-Billa. March 15, 1857. No. **6642.**

3. **C. subulata** Roth., Nov. Plant. Sp. p. 23 (1821) ; C. B. Clarke, *l.c.*, p. 148 ; Durand & Schinz, *l.c.*, p. 428.

*C. heterantha* Welw. ex Clarke, *l.c.*

Pungo Andongo.—Sometimes annual erect filiform, slender, growing in dense masses, sometimes ascending, branched from the base, biennial and perhaps perennial, with a tuberculately swollen rhizome. The external anterior perianth-leaves ovate-elliptic somewhat concave, the posterior navicular keeled, all white ; lateral petals semicircular-reniform clawed, the third similar but smaller, almost sessile, all a sulphur-chesnut colour and flat. Two stamens with horseshoe-shaped anthers, four with sterile clear yellow connective enlarged in different forms. Style filiform, red, stigma slightly capitellate, yellow. In some specimens the petals were blue (perhaps a different species). Sandy rocks of the præsidium, near Catete, Luxillo, etc. In fl. and fr. Jan. 1857. No. **6633**. Poor meadows near Condo. March 1857. No. **6633***b*.

Huilla.—A herb scarcely a foot long, with long fibrous rhizome, stems prostrate, rooting at the nodes and streaked with red, leaf-sheaths white to pale yellowish with broad purple bands, spathes pale yellowish, bent downwards, flowers small, yellow. Plentiful among crops of maize and *Phaseolus*, on the banks of the river Ema, etc. In fl. Feb. 1860. No. **6588.** An annual much-branched prostrate-ascending herb ; primary stems semi-rotund, branches and branchlets triquetrous, spathes numerous, deflexed, purplish with green-yellow stripes, flowers small, yellow. Too plentiful among maize and almost all kinds of tropical crops ; springs up and flowers in March. Lopollo, 27 March 1860. No. **6589.**

Mossamedes.—*C. heterantha* Welw. ms. Annual, branched, glaucous-green, stem and branches procumbent-suberect, rooting at the nodes,

angled, more or less semicylindrical. Leaves somewhat shining above, paler beneath, striately nerved on both faces. Spathe shortly-stalked, broadly cordate when opened out, acuminately falcate, green, mouth ciliate; pedicel 4-flowered, 2 upper flowers ♀, the third apetalous 3-androus, the lowest and fourth generally aborted. Sepals whitish, membranaceous, very thin, sessile, somewhat obtuse, unequal, more or less ovate-acuminate; petals a rather dark yellowish-chesnut, conchiform with crisped-folded mouth. Flowered in cultivation at Lisbon, Sept. 1861. No. **6587**.

4. **C. benghalensis** L., *l.c.*; C. B. Clarke, *l.c.*, p. 159; Durand & Schinz, *l.c.*, p. 424.

Loanda.—A herb, apparently annual, root with long fibres, branches ascending. Flowers pale blue, rather small. On coarse iron sandstone cliffs behind the city; not seen elsewhere. In fl. Feb. 1854. No. **6621**.

Cazengo.—Dec. 1854. No. **6611**.

Golungo Alto.—Flowers blue, stem divaricately branched, often rooting at every node, or growing on tree-trunks and hanging like a whip, always softly villose. In rather damp once cultivated places, and in gardens among herbs, sometimes on rotting trunks. Near Bango, July 1855. No. **6598**.

Pungo Andongo.—Annual, or perhaps perennial, stems procumbent and rooting, ascending when in flower, leaves pale green, roughly setulose. Flowers small, blue. Sepals obovate-circular, the posticous smaller; the two upper long-clawed petals spathulate with a concave-conchiform blade with denticulate margin. Spathe rather small, almost triangular in outline, upper margin truncate. Plentiful in a few places on shaded rocks in thickets on the huge rocks of the præsidium. The leaves of the specimen are smaller than usual owing to want of rain. In fl. and fr. April 1857. No. **6646**.

Huilla.—Flowers blue or bright blue. Sparsely shaded rather damp pastures of Morro de Monino. Feb. 1860. No. **6582**.

Var. **hirsuta** C. B. Clarke, *l.c.*, p. 160; Durand & Schinz, *l.c.*

Loanda.—A climbing herb, 3 to 5 ft. and longer, stem angled, roughish; flowers smaller than usual, deep azure blue. Thickets of Alto das Cruzes. In fl. Feb. 1858. No. **6622**.

5. **C. africana** L., *l.c.*

Var. **Krebsiana** C. B. Clarke, *l.c.*, p. 164; Durand & Schinz, *l.c.*, p. 423.

Pungo Andongo.—A slightly succulent herb, with prostrate radiating shoots and yellow flowers. Secondary thickets between Catete and Quilanga. In fl. Jan. 1857. No. **6635**. A perennial herb with fleshy-tuberous roots; prostrate-ascending. Flowers yellow. Thicket-grown pastures between Pungo Andongo and the river Cuanza; found occasionally. In fl. middle of Nov. 1856. No. **6640**.

Var. **polyclada** C. B. Clarke, *l.c.*, p. 165; Durand & Schinz, *l.c.*

*C. polyclada* Welw. ex C. B. Clarke, *l.c.*

Huilla.—Leaves bright grass-green; flowers small, yellow. Cultivated fields near Lopollo. May 1860. No. **6581**.

6. **C. barbata** Lam. Tabl. Encycl. i. p. 129 (1791); C. B. Clarke, *l.c.*, p. 166; Durand & Schinz, *l.c.*

Golungo Alto.—Nov. Also north of Ambriz. Material insufficient for certain determination. No. **6612**.

7. **C. angolensis** C. B. Clarke, *l.c.*, p. 167 ; Durand & Schinz, *l.c.*

Huilla.—A perennial herb, with several oblique purplish stems, branching at the apex, leaves herbaceous-green ; flowers small, yellow. Sporadic in sandy herb-grown places near Lopollo, behind the fortress. In fl. Dec. 1859. Monino ; Jan. 1860. No. **6583**. Decumbent. Flowers yellow. On the marshy margins of woods. Morro de Lopollo. April 1860. No. **6593**.

The following which bears no fruit may belong to this species.

Pungo Andongo.—Roots fleshy-fibrous, shoots spread stellately on the ground, branches elongated, branched again, prostrate. Leaves rigid, subglaucous. Flowers deep sulphur-coloured. Wooded thickets in ferruginous mud, Sobato Cabanga. In fl. middle of Jan. 1857. No. **6626**.

8. **C. Forskalaei** Vahl Enum. Pl. ii. p. 172 (1806); C. B. Clarke, *l.c.*, p. 168 ; Durand & Schinz, *l.c.*, p. 425.

Pungo Andongo.—A succulent decumbent herb, soon ascending, climbing among the firmer grasses. Flowers dark blue, rather large, spreading. Damp meadows on the river Cuanza near N-billa, March 1857. No. **6634**.

9. **C. Kotschyi** Hassk. in Schweinf. Beitr. Fl. Aethiop. p. 207 (1867) ; C. B. Clarke, *l.c.*, p. 173 ; Durand & Schinz, *l.c.*, p. 426.

Barra do Bengo.—A glaucous-green herb, with ascending green stems, leaf-sheaths livid purple ; flowers deep dark blue. Thickets very dry in winter, flooded in summer, between Teba and Cacuaco. May 1858. No. **6624**.

Loanda.—An annual herb with purple prostrate-ascending stalks and sky-blue flowers. Short thicket-grown sunny stony places with a species of *Aloe*, etc., near Quicuxe, April 1854. No. **6614**. Dense thickets of Alto das Cruzes towards Museque de Luiz Gomes, May and July 1854. No. **6620**.

10. **C. latifolia** Rich. Tent. Fl. Abyss. ii. p. 340 (1851); C. B. Clarke, *l.c.* ; Durand & Schinz, *l.c.*

Ambriz.—Shrubby damp places near the river Quizembo, Nov. to Dec. 1853. No. **6615** (in part).

Loanda.—An annual, more rarely biennial herb, shoots 3 to 6 ft., oblique, weak, half-climbing among shrubs, green-purplish, angled, sheaths glandular-hairy, subviscous. Leaves most variable, often polymorphic in the same specimen, narrowly lanceolate and elliptical. Flowers sky-blue. Plentiful in thickets of Capparideæ about Alto das Cruzes. In fr. Feb. 1858. No. **6613**. Annual, at first erect and flowering when scarcely a foot high, soon branched, branches spreading, reaching 3 to 7 ft. in length and half-climbing among shrubs. Flowers dark blue, rather small, fugacious. Very plentiful in damp places with low undergrowth and by the sides of streams near Quicuxe. Flowering from Nov. to end of May 1858. Reared from seed from Libongo taken from a pigeon's crop. Flowered in Welwitsch's garden at Loanda Nov. 1858. No. **6615** (in part). Plentiful in thickets near the sea at Praia de Zamba grande, near Loanda. End of June and beginning of July 1854. No. **6616**. Annual, 1½ to 3 ft., stem branched from the base, branches suberect. Flowers sky-blue. Thickets on poor sandy soil near Maianga de Povo, May 1854. No. **6618**.

11. **C. huillensis** Welw. ex C. B. Clarke, *l.c.*, p. 175; Durand & Schinz, *l.c.*, p. 425.

Huilla.—Spathes very large, veined with purple; flowers azure-blue. Rather damp pastures, dry in winter, between Lopollo and Nene, but not elsewhere, Apr. 1860. No. **6585**.

12. **C. spectabilis** C. B. Clarke, *l.c.*; Durand & Schinz, *l.c.*, p. 428.

Huilla.—Flowers sky-blue. Woods near the river Monino growing with *Gloriosa simplex*. Feb. and Apr. 1860. No. **6594**.

Var. **ramosa** C. B. Clarke, *l.c.*; Durand & Schinz, *l.c.*

Pungo Andongo.—Shoots appressed to the earth, nodes rooting, more or less villous, ascending in the flowering stage. Flowers not sky-blue but bright dark blue. Grassy places in sandy marshes between Quibanga and Guinga. In fl. Jan. 1857. No. **6629**.

13. **C. Welwitschii** C. B. Clarke, *l.c.*; Durand & Schinz, *l.c.*, p. 429.

Pungo Andongo.—A perennial herb with tuberous root, cæspitose, stems generally purplish. Sepals concave, the two anterior orbiculate-ovate, deflexed, the posterior ovate, erect; anterior petal sessile, broadly ovate-acuminate, reflexed; posterior petals orbiculate-spathulate long-clawed, margin undulate and repand-dentate or irregularly crenate. Sepals and anterior petal dull violet-green; posterior petals bright sulphur-yellow. Filaments of the three sterile stamens erect, of the fertile declinate. Two fertile anthers regular, the third on the anterior margin of a petaloid connective. Sterile anthers deep sulphur-coloured. Style declinate, stigma slightly capitulate, a little longer than the stamens. Very plentiful, widely cæspitose on the slopes of the volcanic rocks of the præsidium. In fl. and fr. Dec. 1856 and Jan. 1857. No. **6627**. Flowers bright yellow. Damp rocks of Cabonda on the præsidium, Jan. 1857. Nos. **6632**, **6637**. Flowers bright yellow, spathes marked with dark purple lines. Cazella, 18 Oct. 1856. No. **6638**. A glaucous-green ascending herb, with deep bright yellow flowers. Plentiful in rocks and damp pastures throughout the whole district. In fl. Feb. 1857. No. **6639**.

Huilla.—A herb with bulbous-tuberous rhizome, tubers moniliform, erect, ½ to ⅓ ft. high, herbaceous-green, stem flattened and like the leaf-sheaths pilose, flowers yellow. Sepals greenish-purple, upper petals roundly spathulate, yellow, anterior greenish-purple, concave. Plentiful in sparsely grassed pastures at Humpata, Jan. 1860. No. **6586**.

14. **C. capitata** Benth. in Hook. Niger Flora p. 541 (1849); C. B. Clarke, *l.c.*, p. 176; Durand & Schinz, *l.c.*, p. 424.

Pungo Andongo.—Flowers yellow, spathes ciliate with long tawny golden hairs. Shady woods of Barranco de Pedra Songue, but not seen elsewhere. In fl. Feb. 1857. No. **6647**.

15. **C. aspera** Don ex Benth., *l.c.*, p. 542; C. B. Clarke, *l.c.*, p. 180; Durand & Schinz, *l.c.*, p. 423.

Huilla.—Among crops of *Penicillaria* near Humpata, Jan. 1860. No. **6592**.

16. **C. firma** Welw. ex C. B. Clarke, *l.c.*

*C. aspera* var. *firma* C. B. Clarke, *l.c.*; Durand & Schinz, *l.c.*

Pungo Andongo.—A narrowly erect or ascending, firm, succulent, blood-red-purple herb; flowers dark blue. Panda woods between

Calundo and Mangue, in fr. March 1857. No. **6644**. Rather rare in shady woods round Pedras de Guinga and Mangue. In fr. and perhaps with a few flowers, March 1857. No. **6645**.

17. **C. Bainesii** C. B. Clarke, *l.c.*, p. 184 ; Durand & Schinz, *l.c.*, p. 423.

Pungo Andongo.—A glaucous herb 3 to 5 in. long, with tuberous root and ascending stems. Flowers sky-blue ; spathes proportionately large. Thickets near Ponte de Luxillo, Jan. 1857. No. **6636**. By streams on the præsidium near Fonte de Cazella, Jan. 1857. No. **6641**. Thicket-grown sandy woods near Condo, March 1857. No. **6643**.

4. **ANEILEMA** R. Br.; Benth. & Hook. f. Gen. Pl. iii. p. 849.

1. **A. sinicum** Lindl. Bot. Reg. t. 659 (1822) ; C. B. Clarke in D.C. Mon. Phan. iii. p. 212 (1881); Durand & Schinz, Consp. Fl. Afr. v. p. 432.

Pungo Andongo.—Flowers proportionately large, deep sky-blue. Plentiful in marshes on the west of the præsidium, and by streams in the præsidium itself. In fl. Jan. 1857. Nos. **6627**, **6628**.

Huilla.—Erect ; flowers sky-blue. Plentiful in marshy places near streams round the base of Morro de Lopollo, April 1860. No. **6591**.

2. **A. æquinoctiale** Kunth, Enum. iv. p. 72 (1843) ; C. B. Clarke, *l.c.*, p. 221 ; Durand & Schinz, *l.c.*, p. 429.

Golungo Alto.—Flowers sky-blue. Damp shady banks of the river Delamboa. Flowers yellow. Shady places on the left bank of the same river, Aug. 1855. No. **6605**.

3. **A. beniniense** Kunth, *l.c.*, p. 73 ; C. B. Clarke, *l.c.*, p. 224 ; Durand & Schinz, *l.c.*, p. 430.

Golungo Alto.—Stems 3 to 4 ft., decumbent and rooting at the base, rather hard, nodose ; flowers dark blue. Shady woods by streams in rather lofty places, somewhat rare. Mata de Quibanga, Sobato Mussengue, end of Dec. 1855. No. **6600**. An erect or ascending herb, 2 to 3 ft. high. Flowers small white. By streams in very shady mountain woods. Zengas de Queta, 19 March, 1856. No. **6600b**. Flowers deep sky-blue. Rather plentiful in very shady woods on the banks of streams near Trombeta, Cambondo, and Sange, Oct. and Sept. 1854. No. **6601**. No. **6654** (no notes).

4. **A. pedunculosum** C. B. Clarke, *l.c.*, p. 228.

Var. **luteum** C. B. Clarke, *l.c.*; Durand & Schinz, *l.c.*, p. 431.

Pungo Andongo.—A slender herb, apparently annual, erect ; flowers yellow. With Begonias in shade on the rocky heights of Pedras de Guinga, Jan. 1857. No. **6630**.

5. **A. Welwitschii** C. B. Clarke, *l.c.*, p. 229 ; Durand & Schinz, *l.c.*, p. 432.

Golungo Alto.—Flowers sky-blue. Marshy places between Catumba and Ohai, Apr. 1860. No. **6597**.

Huilla.—Flowers sky-blue. Wet places on the edges of woods, Lake Ivantâla, beginning of March 1860. No. **6596**.

6. **A. Ehrenbergii** C. B. Clarke, *l.c.*; Durand & Schinz, *l.c.*, p. 430.

Golungo Alto.—A herb 2½ to 3 ft. or higher, shoots ascending. Flowers small, greenish, lower petal yellowish. Rather rare in primæval woods on the mountains of Alto Queta. End of Dec. 1855. No. **6610**.

PUNGO ANDONGO.—Shoot rooting, ascending. Flowers yellow. Rocks of the præsidium. In fl. Feb. 1857. No. **6649**.

I have followed Mr. C. B. Clarke's suggestion in regard to these plants; I have not seen the type of *A. Ehrenbergii*.

5. **BUFORRESTIA** C. B. Clarke; Benth. & Hook. f. Gen. Pl. iii. p. 850.

1. **B. imperforata** C. B. Clarke in DC. Mon. Phan. iii. p. 234, t. 7 (1881); Durand & Schinz, Consp. Fl. Afr. v. p. 433.

CAZENGO.—Rhizome very far creeping, stoloniferous. Flowers whitish to very pale violet. Coffee region of Mount Muxaulo by streams, seen only in one place. With a few flowers and ripe fruit middle of June 1855. No. **6607**. A herb 1 ft. high, with purple-green stem and leaves, and white flowers; growing in water. By cataracts on streams near Palmira. Dec. 1854. COLL. CARP. 1041.

6. **CYANOTIS** Don; Benth. & Hook. f. Gen. Pl. iii. p. 851.

1. **C. nodiflora** Kunth, Enum. iv. p. 106 (1843).

Var. **madagascarica** C. B. Clarke in DC. Mon. Phan. iii. p. 258 (1881); Durand & Schinz, Consp. Fl. Afr. v. p. 435.

*C. flexuosa* Welw. ex C. B. Clarke, *l.c.*

HUILLA.—Shoots purple. Flowers pale blue. Very rare in damp rocky places, Monino. April 1860. No. **6584**.

Very near the type.

2. **C. lanata** Benth. in Hook. Niger Flora, p. 542 (1849); C. B. Clarke, *l.c.*; Durand & Schinz, *l.c.*, p. 434.

PUNGO ANDONGO.—The whole herb succulent, purplish. Plentiful on the highest rocks of the præsidium, Cazella, S. Antonio, and Songue. In fl. Jan. 1857. No. **6650**.

Var. **sublanata** C. B. Clarke, *l.c.*; Durand & Schinz, *l.c.*

PUNGO ANDONGO.—No. **6648**. (No notes.)

Var. **Schweinfurthii** C. B. Clarke, *l.c.*; Durand & Schinz, *l.c.*

PUNGO ANDONGO.—Gregarious on rocks covered with rich soil between Candumba and Mangue. In fl. and fr. March 1857. No. **6653**.

3. **C. Mannii** C. B. Clarke, *l.c.*; Durand & Schinz, *l.c.*

*Cyanopogon* sp. Welw. ex C. B. Clarke, *l.c.*

PUNGO ANDONGO.—Woody places near Mangue and Mutollo, but somewhat rare. March 1857. No **6652**.

4. **C. longifolia** Benth., *l.c.*, p. 543.

Var. **Bakeriana** C. B. Clarke, *l.c.*, p. 259; Durand & Schinz, *l.c.*

PUNGO ANDONGO.—A cæspitose herb with fascicled tuberous root. Flowers a very beautiful sky-blue but fugacious. Plentiful in damp rocky pastures on the præsidium. In fl. Jan. and Feb. 1857. No. **6651**.

HUILLA.—Flowers a very beautiful azure-blue. The whole plant green when alive, but becoming pale on drying. Damp but rocky pastures flooded in summer. In fl. April 1860. No. **6595**.

7. **FLOSCOPA** Lour.; Benth. & Hook. f. Gen. Pl. iii. p. 852.

1. **F. glomerata** Hassk. Commel. Ind. p. 166 (1870); C. B. Clarke in DC. Mon. Phan. iii. p. 267 (1881); Durand & Schinz, Consp. Fl. Afr., v. p. 436.

Pungo Andongo.—An annual herb, branched or simple, ascending, somewhat succulent. Flowers a beautiful violet. Rather rare in wooded marshes Sobato de Quibanga and near Quilanga. In fl. middle of April 1857. No. **6631.**

Huilla.—A herb 4 to 10 ft., rooting at the bottom of the water, stems ascending, floating, slender, subfistulose; flowering shoots emerging; leaves bright green. Flowers a beautiful violet. Plentiful in the great lake Ivantâla, about the mouth of the river Moambo, growing with reeds, willows, species of *Epilobium*, *Nymphæa cærulea*, etc., often rooting in very deep parts (8 to 10 ft.). In fl. and unripe fr. 2 March 1860. No. **6590.**

8. **TINANTIA** Scheidw.; Benth. & Hook. f. Gen. Pl. iii. p. 853.

1. **T. fugax** Scheidw. in Allgem. Gartenzeit. 1839, p. 365; C. B. Clarke in DC. Mon. Phan. iii. p. 285 (1881).

Angola.—Perhaps introduced by birds. Sprang up spontaneously in flower-pots where several African and other plants were reared, at the Ajuda garden (near Lisbon). In fl. Sept. 1863.

As this is the only African record of this tropical American plant it might perhaps be one of the "other plants" referred to by Welwitsch in his note and not African at all.

## XV. FLAGELLARIEÆ.

1. **FLAGELLARIA** L.; Benth. & Hook. f. Gen. Pl. iii. p. 860.

1. **F. guineensis** Schum. in Dansk. Vidensk. Selsk. iii. p. 201 (1828); N. E. Brown in Fl. Cap. vii. p. 16 (1897).

*F. indica* Auct. (in part), (non L.); Durand & Schinz, Consp. Fl. Afr. v. p. 436.

Ambriz.—A very elegant plant, with habit of *Smilax*, high climbing stem, very spreading branches, and cirrhate leaves. Sporadic, near the sea, on damp wooded hills near the town of Ambriz and to the south of it. In fr. end of Nov. 1853. No. **3009.**

Scarcely distinct from *F. indica* L.

## XVI. JUNCACEÆ.

1. **JUNCUS** L.; Benth. & Hook. f. Gen. Pl. iii. p. 867.

1. **J. maritimus** Lam. Encyc. Method. iii. p. 264 (1789); Buchen. Mon. Junc. in Engl. Jahrb. xii. p. 256 (1890); Durand & Schinz, Consp. Fl. Afr. v. p. 444.

Mossamedes.—Marshy places with tall species of *Scirpus* and *Tamarix* at Aguadas near Mossamedes. In fr. and with a few flowers July 1859. In and by ponds near the river Bero. Sept. 1859. No. **3007.**

2. **J. oxycarpus** E. Mey. ex Kunth Enum. iii. p. 336 (1841); Buchen., *l.c.*, p. 336; Durand & Schinz, *l.c.*

Huilla.—Perianth-segments equal, acute, gradually acuminate; capsule scarcely shorter than perianth, ovoid, triquetrous, subobtuse, mucronate, shining. Seeds exappendiculate, obovate-oblong, shortly mamillate. Very plentiful and ubiquitous in wet sandy meadows with *Salix*, *Rubus*, *Potamogeton* and species of *Ranunculus* near streams

throughout the whole territory. In fl. and fr. Nov. 1859. Plentiful with species of *Xyris* on the river Mumpulla, Oct. 1859. On the brook of Lopollo, Dec. 1859. No. **3008**.

## XVII. PALMÆ.

### 1. **PHŒNIX** L.; Benth. & Hook. f. Gen. Pl. iii. p. 921.

1. **P. reclinata** Jacq. Fragm. Bot. p. 27, t. 24 (1800); Beccari Malesia iii. p. 346 (1890); Drude in Engl. Bot. Jahrb. xxi. p. 110 (1895).

*P. spinosa* Schum. & Thonn. in Dansk. Vidensk. Selsk. iv. p. 211 (1829); Welw. Apont. p. 587, No. 48; Synops. Expl. pp. 7, 44; Durand & Schinz, Consp. Fl. Afr. v. p. 455. Native name Calólo.

Barra do Dande.—Growth densely cæspitose, very social, occurring only in damp places on the banks of the lake and river, affording excellent wine. At present almost stemless, trunk in the adult fruiting plant 5 to 15 or 30 ft. and higher. Lower leaf-pinnæ spinescent. Spadices proportionately large, thyrsoid, orange-yellow; berries obovate-elliptical, mucronate, the size of a small olive, slightly fleshy with a taste not unlike "tamar" (tamarind), and a tawny orange colour. Seed ellipsoid, with a very deep ventral furrow, endocarp when mature dull reddish. Plentiful on the banks of the lake and of the river Dande near Bombo, and everywhere used for making wine (Maluvo), hence the stems rarely reach a height of more than 6 to 7 ft. In fr. Sept. 1858. No. **6659**. Coll. Carp. 165.

Icolo e Bengo.—8 to 15 ft., often scarcely 3 ft. or even acaulescent, leaves 6 to 10 ft. Plentiful and cæspitose in damp valleys near Mundal-Angola between Tantambondo and Quicanda. In fl. Sept. 1856. No. **6658**.

Calumguembo.—(District deduced from Welwitsch's diary of Sept. 1854). Fruit unripe. Wine-palm; used also for basket-work. Sept. 1854. No. **6672**.

Pungo Andongo.—Forms thickets in the marshes, or a stem 15 to 25 ft. and higher, with a comose top, wood very hard and strong, forming excellent timber for houses; yields excellent wine (Maluvo). Spadix brick-red-orange, woody-fibrous, male shortly stalked, paniculately branched, flowers snow-white with scarcely a tendency to yellow, female spadix with a stalk 2 to 4 ft., orange-coloured, very high, flattened. Ripe berries dull yellow-orange, small, $\frac{1}{3}$ to $\frac{1}{2}$ in., elliptic-oblong, slightly fleshy but not unpleasant to taste, seed deeply furrowed, albumen compact, not reticulate, embryo dorsal. Leaves 12 to 18 ft., petiole with a double furrow on the upper face, lower leaflets spine-like, short, upper $1\frac{1}{2}$ ft., fasciculate, opposite, linear-lanceolate, acuminate, green. Very plentiful on the marshy banks of the rivers Cuanza, Lombe, etc., and at Sansamanda and Mopopo. In fl. and fr. Feb. 1857. Nos. **6667**, **6659***b*.

### 2. **RAPHIA** Beauv.; Benth. & Hook. f. Gen. Pl. iii. p. 935.

1. **R. vinifera** Beauv. Fl. Owar. et Ben. i. p. 77, tt. 44[1], 45, 46[1] (1806 or 1807); Drude in Engl. Bot. Jahrb. xxi. p. 111 (1895); Durand & Schinz, Consp. Fl. Afr. v. p. 457.

Huilla.—Plentiful but generally almost acaulescent or with a shortened stem near streams at 5200 to 5800 ft. in Morro de Lopollo, on the river of Monino, etc., not seen in flower. April 1860. No. **6657**.

2. **R. textilis** Welw. Apont. p. 584 No. 2 (1859); Synops. Explic. p. 39 (1862).

*R. Welwitschii* Wendl. in Trans. Linn. Soc. xxiv., p. 439, t. 42 B. (1864); Drude, *l.c.*; Durand & Schinz, *l.c.*

*Metroxilon textile* Welw. Apont., *l.c.*

Golungo Alto.—No. **6666**; Delamboa, Dec. 1855. No. **6671**. Coll. Carp. 1054, 1056. Near rivulets at 1800 to 2000 ft. altitude and 120 miles from the coast.

Barro do Dande.—*Metroxylon* spec. ? Colonial name Bordaõ grande. A palm 30 to 40 ft., stem thick, rather smooth, leaves long-sheathing, somewhat strict, pinnæ 3 to 5 ft. long, midrib raised, spinulose; spadices very large, elliptico-cylindrical, pendulous. Berries lacquered-red, obovate, covered with woody retrorse scales, one-seeded. Gregarious in the river Dande. Pinnæ gathered Nov. 1853. No. **6663**.

3. **R. angolensis** Rendle sp. nov.

Among some palm fruits given to the British Museum by Dr. Welwitsch in 1865 is a specimen which does not accord with any hitherto described species. It is nearest to *R. longiflora* Mann & Wendl., but is a larger fruit and longer in proportion to its breadth, $4\frac{1}{3}$ in. long by $1\frac{1}{2}$ in. thick, with pale brown almost square scales darkening towards the blunt base, the largest slightly exceeding $\frac{3}{4}$ in. each way; seed narrowly ellipsoid with a blunt almost flattened apex and tapering very gradually from above the middle to the base; embryo $\frac{1}{3}$ the distance from the top, rumination of similar character but much rarer than in *R. longiflora*.

Angola.—Received 1865.

Pechuel-Loesche in his account of his Loango Expedition (iii. p. 164) gives a new name without description (*R. maxima*) to a palm which has a "long large fruit," and may, as Drude suggests, (*l.c.*, p. 128) be *R. Hookeri* or the one now in question or some other long-fruited species.

3. **HYPHÆNE** Gaertn.; Benth. & Hook. f. Gen. Pl. iii. p. 940.

1. **H. guineensis** Schum. in Dansk. Vidensk. Selsk. iv. p. 219 (1829); Drude in Engl. Bot. Jahrb. xxi. p. 123 (1895); Durand & Schinz, Consp. Fl. Afr. v. p. 461.

*H. coriacea* Welw. (non Gaertn.) Apont. p. 584, No. 1 (1859).

Ambriz.—Textile and wine-yielding. Maritime hills near Quizembo. Nov. 1853. No. **6668**. Called by the negroes Diteva Mateva.

Barra do Dande.—Stem generally simple, 10 to 15 ft., more rarely forked from the middle, or one branch may be twice forked forming 5 heads; it also occupies large tracts of the coast of Angola, but is almost acaulescent and never flowers. Spadices breaking from among the leaves, nodding, soon pendulous. Outer perianth of male flower tubular, erect, tripartite, subobtuse, thinner than the inner; inner segments spreading, spathulate, concave with a dilated hoodlike tip, densely striately veined, purplish on the outside, greenish-yellow inside. Drupes as big as a fist, orange-purple, obconic-turbinate, sarcocarp fibrous mixed with a little pulp which tastes like *Ceratonia* pods, has a pleasant smell, and is eaten everywhere by negroes and monkeys. The leaves are used for various domestic purposes. A social plant growing in large numbers along long tracts of coast from Dande and Lifune as

far as the mouth of the Cuanza. In male fl, Lifune Nov. 1853; in fl. and fr. end of Sept. 1858. No. **6670**. Called by the negroes Mateva. Plentiful on dry or sandy hills, especially between Barra do Bengo and Barro do Dande. Nov. 1853. No. **6662**.

Loanda.—Very frequent on the coast between Ambriz and Loanda. Coll. Carp. 1052.

2. **H. benguellensis** Welw. Synops. Expl. p. 40 (1862); Wendl. in Bot. Zeit. xxxix. p. 92 (1881); Drude, *l.c.*; Durand & Schinz, *l.c.*, p. 460.

Mossamedes.—A very elegant palm with the habit of *Hyphæne*, stem 20 to 35 ft. high, about ½ ft. thick, straight, cylindrical, moderately ventricose above the middle, always simple. Berries exactly spherical, a shining dull brown. Plentiful in rather damp sandy places near the banks of the river Caroca near Porto-Pinda and Cabo Negro, forming very elegant woods round the native village Caroca. In fr. Sept. 1859. No. **6656**.

4. **ELÆIS** Jacq.; Benth. & Hook. f. Gen. Pl. iii. p. 944.

1. **E. guineensis** Jacq. Select. Stirp. Amer. p. 280, t. 172 (1763); Welw. Synops. Expl. pp. 43, 44, 53 (1862); Drude in Engl. Bot. Jahrb. xxi. p. 112 (1895); Durand & Schinz, Consp. Fl. Afr. v. p. 462.

Barra do Bengo.—Plentiful in damp woods on the banks of the river Bengo. S. Antonio, Dec. 1853. No. **6660**. Called by the negroes Die, plural Maie.

Golungo Alto.—Young leaves, second year. Banks of river Delamboa. May 1855. No. **6664**. Wool from the leaf of the oil palm "Uruco" or "Urucu." Coll. Carp. 1061.

Var. **macrosperma** Welw. Apont. p. 584. No. 3 (1859).

Icolo e Bengo.—Quifandongo. May 1860. Coll. Carp. 1057. Native name Dihôho. Bengo shore. Sept. 1860. Coll. Carp. 1060.

Var. **microsperma** Welw., *l.c.* Fruit 1½ in. or less.

Icolo e Bengo.—Banks of river Bengo, August 1858. Coll. Carp. No. 1058. Native name, Disombo.

Golungo Alto.—Everywhere plentiful in woods. Bango, July 1856. Coll. Carp. 1059.

5. **COCOS** L.; Benth. & Hook. f. Gen. Pl. iii. p. 945.

1. **C. nucifera** L. Sp. Pl. p. 1188 (1753); Drude in Engl. Bot. Jahrb. xxi. p. 112 (1895).

Loanda.—Plentifully cultivated along the whole coast of Angola to three and even four leagues inland. Flowers twice or thrice in each year. Island of Loanda, Jan. 1854. No. **6661**. Called by the Portuguese Coqueiro.

## XVIII. PANDANACEÆ.

1. **PANDANUS** L.; Benth. & Hook. f. Gen. Pl. iii. p. 949.

1. **P. Welwitschii** Rendle in Journ. Bot. 1894 p. 324, t. 347.

*P.* (*Candelabrum* Fl. Nigr.?) Welw. Apont. p. 586, No. 36 (1859).

Pungo Andongo.—Stem 1 ft. thick at base, 10 to 15 ft., seldom more than 20 ft. high. The toughest of all the Angolan plants. The rapidity with which even the thicker shoots will take root in inundated

places is made use of in Cabinda and elsewhere in cutting off from the main bed small bays of the river when in flood by *Pandanus* shoots, whereby the fish which are in these bays may be very easily caught when the flood subsides. Fruit ovate-elliptical, shining when ripe, 6 by 3 in. Plentiful, but with interrupted distribution, on the banks of the river Cuanza, at Candumba, and in Calemba Island, March 1857 (fr. scarcely ripe). No. **5770**. Common name Quitari or Quicari. A tree 10 to 15 ft., palm-like or rather resembling an arborescent *Ananassa*. Plentiful on banks of river Cuanza, near Candumba, March 1857. Coll. Carp. 1015.

## XIX. TYPHACEÆ.

1. **TYPHA** L.; Benth. & Hook. f. Gen. Pl. iii. p. 955.

1. **T. capensis** Rohrb. in Verhandl. Bot. Ver. Prov. Brandenb. xi. p. 96 (1870).

*T. æquinoctialis* Welw. ex Kronf. in Verhandl. Zool.-bot. Ges. Wien xxxix. p. 156 (1889).

Golungo Alto.—*T. æquinoctialis* Welw. ms. Whole plant herbaceous-green, becoming glaucous. Leaves with very acute margin, and broadly sheathing base, sheath with a membranous margin, median portion of leaf convex, inflated and spongy, upper part and end flattened. Female spadix separated from the male by only $1\frac{1}{2}$ or sometimes not $\frac{1}{2}$ line. Spongy marshes on the right of the Coango and Quiapose. July 1855. No. **241**. Used for tinder (cf. Sumauma = *Ceiba*).

Huilla.—Plentiful by river banks near Lopollo along with species of *Polygonum*, *Rumex* and Compositæ. In fr. Nov. 1859. Plentiful in pools on the banks of the stream Quipumpunhine, near Humpata. In fl. April 1860. No. **243**.

Mossamedes.—Plentiful in deep pools near Mossamedes (Aguadas) and rather plentiful in lakes at the mouth of the river Giraûl. In fl. and fr. July 1855. No. **244**.

The following specimens without flower may belong here.

Loanda.—Rather rare by pools near the sea and near S. Pedro. Without fl. Feb., May, and July 1854. No. **242**.

## XX. AROIDEÆ.

1. **PISTIA** L.; Benth. & Hook. f. Gen. Pl. iii. p. 964.

1. **P. Stratiotes** L.; Sp. Pl. p. 963 (1753).

Var. **obcordata** Engl. in Mart. Fl. Bras. iii. pt. 2. p. 214 (1878), in DC. Mon. Phan. ii. p. 634 (1879).

Ambriz.—Lakes and even small slowly flowing streams or ponds round Quizemba, on the right of the river Loge. Nov. 1854. No. **216**.

Icolo e Bengo.—Plentiful in lakes round Prata, *e.g.* in the great lake of Quilunda. In fl. and fr. 14 Sept., 1854. No. **214**. Specimens growing on the dried-up edges of the lake are distinguished from the swimming specimens by their more glaucous colour.

Pungo Andongo.—Plentiful on the sides of the river Cuige near Quibinda, growing with *Azolla* and *Nymphæa*. Without fl. March 1857. No. **215**.

Var. **linguiformis** Engl. in Mart. Fl. Bras., *l.c.*, p. 215, in DC. Mon. Phan. ii. p. 635.

Golungo Alto.—Nerves prominent below and above. Plentiful in ponds of but little extent by the banks of the river Quiapoze, near Sange. In fl. and fr. March 1855. No. **217**.

Mossamedes.—Leaves linguiform, becoming gradually cuneate towards the base, hairy on both sides, veins converging at the base in a densely hairy area delimited by a bow-shaped line. Very plentiful in lakes round the mouth of the river Giraûl, growing with *Marsilea* and *Jussiæa repens*, 19 July, 1859. No. **218**. A specimen in very good fruit gathered at the same place, Lagoa da Foz do Giraûl, July 1859. No. **218***b*.

2. **SAUROMATUM** Schott; Benth. & Hook. f. Gen. Pl. iii. p. 966.

1. **S. nubicum** Schott, Syn. Aroid. i. p. 25 (1856); Engl. in DC. Mon. Phan. ii. p. 570; Durand & Schinz, Consp. Fl. Afr. v. p. 480.

Ambaca.—Tubers hemispherical. Tolerably rare in rock-fissures in the great cavern called Puri Cacarambola; Oct. 1856. No. **229**.

3. **STYLOCHITON** Lepr.; Benth. & Hook. f. Gen. Pl. iii. p. 969.

1. **S.? natalense** Schott Syn. Aroid. i. p. 132 (1856); Engl. in DC. Mon. Phan. ii. p. 523; Durand & Schinz, Consp. Fl. Afr. v. p. 479.

Pungo Andongo.—An acaulescent herb, perennial, with a tuberculose yellow-flesh-coloured rhizome with strong thick fibres 1½ foot long. Leaves hastate, long-stalked, petiole spotted with purple at the base, cylindrical, firm, lateral leaf-lobes, obtuse, median shortly and abruptly acuminate, bright green and somewhat shining above, glaucous-pruinose beneath; primary veins all converging. Flowers apparently hypogæal. Berries whitish, angulate-subpyriform, remains of stigma forming an umbo, bilocular, one-seeded (one loculus being generally empty), closely crowded into a shortly-stalked underground head. Here and there in thickets with short herbage near the stream between Quilange and Catete on the præsidium. One specimen with unripe fruit, the rest barren; Feb. 1857. No. **231**.

Probably a distinct species; but, as the material is limited to a single plant with leaf but no flower or fruit, it is impossible to be more precise.

4. **HYDROSME** Schott in Öst. Bot. Wochenbl. vii. p. 389. (1857).

*Amorphophallus* Benth. & Hook. f. Gen. Pl. iii. p. 971, *ex parte*.

1. **H. angolensis** Welw. ex Schott in Journ. Bot. 1865, p. 35; Engl. in DC. Mon. Phan. ii. p. 324; Durand & Schinz, Consp. Fl. Afr. v. p. 473.

Pungo Andongo.—A herb with a somewhat orbicular-hemispherical tuber, bearing long fibres above about the origin of leaf and flower. Adult leaves 4 to 5 ft., spotted with red at the base, segments subfleshy to membranous. Peduncle excentric, at the side of the leaf, variegated with green and purple. Spathe dark purple, hooded, spreading, shorter than the spadix. Spadix very long (almost 6 ft.), male flowers following closely on the female, appendix long, almost naked, dark purple, hollow, subobtuse. Anthers dehiscing at the apex by pores, pollen orange-coloured, protruding like a mucilage. The whole flower ex-

tremely fœtid. Sporadic in the huge shady rocky valleys in the præsidium. In fl. Dec. 1856 and Jan. 1857. No. **228.** A unique specimen.

The following number also probably belongs to this species:—

Cazengo.—Petiole straight, solid, ½ inch thick, 3½ ft. long, trifid at the apex, smooth or shortly muriculate. Plentiful, but only seen in one place, by the streams of Muscaula near the cataract. In fruit and leaf Dec. 1854. No. **227.**

2. **H. leonensis** Engl. Bot. Jahrb. i. p. 187 (1881); Durand & Schinz, *l.c.*, p. 474.

*Corynophallus Afzelii* Schott in Öst. Bot. Wochenbl., *l.c.*

*C. leonensis* Engl. in DC. Mon. Phan. ii. p. 326 (1879).

Sierra Leone.—Herb-grown slopes of the mountains near Freetown. Somewhat plentiful, but leaves only were seen; Sept. 1853. No. **219.**

5. **ANCHOMANES** Schott; Benth. & Hook. f. Gen. Pl. iii. p. 973.

1. **A. dubius** Schott Prodr. Syst. Aroid. p. 135 (1860); Engl. in DC. Mon. Phan. ii. p. 305, Bot. Jahrb. i. p. 486; Durand & Schinz, Consp. Fl. Afr. v. p. 473.

Golungo Alto.—A very distinct genus, near *Amorphophallus* and *Pythonium* in habit, but distinguished by its uninterruptedly androgynous spadix covered with stamens right to the tip. A huge herb, with a very large tuber, as big as a child's head, fleshy and succulent, white inside, dark-coloured outside; growing up in the spring, foretelling the first rains. Flowers appearing long before the leaf. Tuber cylindrical-ovate, 1 to 2 ft. below the surface. Scape 2 to 4 ft., green, hard, fleshy, solid, muricate, cylindrical. Spathe white, becoming dark with age, 1 to 1½ ft. long, thick, fleshy, stiff, brittle, lanceolate, involute, nearly straight, slightly hooded at the top. Spadix in well-developed specimens a foot long. Ovaries dull red or a greenish-livid colour, conical, almost with no style, stigma apiculate; anthers prismatic, whitish-yellow. Leaf solitary, huge in old specimens and umbrella-like with a narrow green cylindrical stalk 1 to 1½ in. thick, 5 to 11 ft. high, bristling with prickles, dividing above into three compound pinnatifid laminæ, and having at the base membranous papery sheaths ½ to 1½ ft. long, of a rose- or flesh-colour streaked with purple. Full-grown leaves of old individuals are in their umbrella-like expansion 12 to 14 ft. in circumference, and form one of the grandest ornaments of the high valleys. The first division of the leaf is radiate trifid, the further divisions are mostly dichotomous but always in the same plane. The colour of the leaf is a dark, less often a shining, glistening green. Berries oblong-clubshaped, ⅓ to ⅔ in. long, livid purple, 1-seeded. Flowers from September to November; leaf perfected in March and April. Plentiful in mountainous rather shady places by riversides throughout the whole district, up to about 2000 ft. elevation. Near Sange, in fl. Nov. 1854. Rocky places on the river Luinha in the Serra de Alto Queta, Oct. 1855. At the spring of Capopa, March 1855. No. **224.** In fr. June 1856; berries like an olive, black or violet-purple. Coll. Carp. 1017. Specimens of scape and leaves illustrating the evolution of an individual. Wooded mountainous places near the banks of rivulets round Sange, Bango-Aquitamba and Trombeta, Sept. and Feb. 1856. No. **225** (in part). The appearance of this plant at the end of the winter season (August and Sept.) is a sign of the

early arrival of the spring rains ; that is to say, the sooner in September the plant appears, the sooner are the first rains expected.

Cazengo.—Spathe fleshy, white, brittle, erect. Rocky wooded places on the banks of the Luinha. End of Dec. 1854. No. **223**.

Pungo Andongo.—A gigantic herb, with a single leaf developed after the flower, petiole almost 1 in. thick, 3 to 5 ft. high, trifid above, leaflets rhomboid. Spathe $1\frac{1}{2}$ ft. long, a lurid violet-purplish colour. Rocky places of Mata de Pungo near Pungo Andongo. In fl. and then with mature fruit May 1857. Coll. Carp. 1018.

2. **A. Welwitschii** Rendle sp. nov. Habit and foliage very similar to that of the last species; petiole and rachis of leaf-segments aculeate, ultimate leaf-segments unequally rhomboidal, bipartite, peduncle sparsely aculeate ; spathe lanceolate in outline, straight, hooded at the apex, sulphur-yellowish, spotted with red in the inside at the base, spadix more than half the length, whitish, the female portion half the length of the male ; ovaries smooth, greenish, apex rhomboid-elliptical, somewhat flattened, stigma excentric and shallowly conical, almost umbonate, with a depressed apex.

Peduncle 9 to 18 in. long by 2 to $2\frac{1}{2}$ lines thick when dried. Spathe 6 in. long by about $1\frac{1}{2}$ in. greatest diameter ; spadix about 3 in. long, female portion $\frac{2}{3}$ in. thick, male $\frac{1}{3}$ in. thick at the base, tapering gradually towards the apex. Ovary with stigma 2 lines long.

Resembles in habit both the hitherto known West African species, but is distinguished from *A. Hookeri* by its smooth ovaries and yellow colour of spathe, while *A. dubius* differs in its much larger purplish or white spathe, and narrow conical style.

Pungo Andongo.—Wooded thickets of Mata de Pungo. In fl. Oct. 1856 ; in leaf March 1857. No. **226** (in part).

Ambaca.—*En route* from Isanga to Ambaca, middle of Oct. 1856. Nos. **225** (in part), **226** (in part).

6. **COLOCASIA** Schott ; Benth. & Hook. f. Gen. Pl. iii. p. 974.

1. **C. antiquorum** Schott Meletem. i. p. 18 (1832) ; Engl. in DC. Mon. Phan. ii. p. 491 ; Durand & Schinz, Consp. Fl. Afr. v. p. 478.

Golungo Alto.—Shady woods along sides of streams in Serra de Alto Queta, but very rarely flowering. Dec. 1854. No. **220**. Rather damp herb-grown woods between Sange and Menha Lula. Without fl. Sept. 1855. No. **220**[2].

Cazengo.—Lofty shady places on the Serra de Muchaula, growing with a species of *Hydrosme*, but flowers sought in vain. Beginning of Jan. 1855. No. **220**[3]. This Aroid is cultivated singly here and there by the so-called Friticeiros, and is regarded as a sacred or magic plant, but I have nowhere seen it cultivated in Angola for the sake of its edible tuber.

Pungo Andongo.—Woods by streams in Mata de Pungo on the præsidium, but never seen in flower. Feb. 1852. No. **221**.

7. **ANUBIAS** Schott ; Benth. & Hook. f. Gen. Pl. iii. p. 975.

1. **A. heterophylla** Engl. in DC. Mon. Phan. ii. p. 435 (1879), Bot. Jahrb. xv. p. 463 (1893) ; Durand & Schinz, Consp. Fl. Afr. v. p. 476.

Golungo Alto.—A stiff terrestrial herb, with creeping rhizome ultimately becoming almost woody. Leaves very polymorphic. Shady rocky places in primæval woods at a place called Fonte de Quibolo. March and April 1856. Nos. **237, 238.**

Cazengo.—A small subcaulescent plant with thick almost woody rhizome, caudex very short, marked with semicircular leaf-scars, and bearing at the top 4 to 6 leaves, which are long-stalked, ovate-lanceolate, more rarely slightly cordate at the base, hard and leathery, shining above, paler beneath, penninerved, the long-sheathed petiole swollen and bent a little below the blade. Scape lateral, arcuately ascending; spathe convolute below gaping a little at the apex, fleshy, brittle, rather hard, green. Spadix ovate-cylindrical, bearing from base to middle the slightly separated green ovate ovaries crowned with a peltate discoid stigma, and from the middle to the obtuse apex the anthers; sterile flowers absent. Anthers about 8 to 10, vertical, with a thick, peltately truncate connective, unilocular (?) dehiscing lengthwise. Connectives very closely crowded, whitish, anthers snow-white adnate to the connective in a whorl. Very shady primitive woods by streamlets in the mountains called Muxaûlo, plentiful, but not often flowering. In fl. beginning of Jan. 1855. No. **236**. A unique specimen.

Some confusion has arisen in regard to the numbers **236** to **238**. Welwitsch, who submitted his material to Schott, names all three *A. Afzelii* Schott. Engler in DC. Mon. Phan., *l.c.*, founded a new species, *A. heterophylla*, on "Welwitsch No. **236** to **238**" from Golungo Alto. Subsequently in Bot. Jahrb., *l.c.*, he quotes for *A. Afzelii* Angola Welwitsch No. **237** in herb. Schweinfurth, No. **238** in herb. De Candolle, and for *A. heterophylla* Angola, Golungo Alto, Welwitsch No. **236**. Engler accordingly recognises two species in Angola, *A. Afzelii* Nos. **237, 238,** and *A. heterophylla* No. **236**. There is no evidence that he saw the true Welwitsch No. **236**, as Mr. Hiern informs me that no duplicates were distributed. The specimens of **237** and **238** in the British Museum were all collected in the same locality and at the same time in Golungo Alto, and are obviously the same, and conform to Engler's description of *A. heterophylla*. They are both in fruit, and may be distinguished from *A. Afzelii* by the shorter peduncle, which is about equal in length to the leaf-stalk.

2. **A. Afzelii** Schott in Österr. Bot. Wochenbl. vii. p. 399; Engl. Araceæ No. 121, Bot. Jahrb., *l.c.*; Durand & Schinz, *l.c.*, 1857.

"Angola.—Welwitsch No. **237** in herb. Schweinfurth, No. **238** in herb. De Candolle." Engl. Bot. Jahrb., *l.c.*

I have not seen these specimens, and include the species with some doubt.

8. **CALADIUM** Vent.; Benth. & Hook. f. Gen. Pl. iii. p. 976.

1. **C. bicolor** Vent. Descript. Pl. Cels. t. 30 (1800); Engl. in DC. Mon. Phan. ii. p. 457.

Prince's Island.—Plentiful in damp shady places at the foot of the mountain (Pico de Papagaio). In fl. Sept. 1853. No. **222**. This pretty little Aroid is very common in the damp forests, and occurs up to 2000 ft. on the Pico de Papagaio. It may, however, have been introduced from Brazil with trees, many of which, *e.g. Persea gratissima*, Pitangueira (*Eugenia uniflora*), etc., were in very early times transplanted from Brazil to St. Thomas and Prince's Island and have succeeded well.

Island of St. Thomas.—Sept. 1860. No. **6769**.

9. **CULCASIA** Beauv.; Benth. & Hook. f. Gen. Pl. iii. p. 980.

1. **C. scandens** Beauv. Fl. Owar. i. p. 4. t. 3 (1804); Engl. in DC. Mon. Phan. ii. p. 102; Durand & Schinz, Consp. Fl. Afr. v. p. 471.

Golungo Alto.—A very high-climbing shrub, stem as thick as a duck's quill at the base, and of dull chestnut-colour, herbaceous-green at 2 to 3 ft. high, somewhat woody inside, hard, tough. Leaves ovate-acuminate or ovate-oblong, varying in form, coriaceous, shining, pale green beneath. Scapes and spathes slender, rather rare. Spadix white (a well-developed one never seen), spathe green. Berries coriaceous, as big as a small pea, arranged in a short capituliform raceme, one-seeded. Seeds ovate, subconvex on one face, more or less flat on the other, marked with an obovate not very deep pit extending from the base to the middle of the seed. Plentiful in the more lofty primitive woods of the district, *e.g.* Mata de Quisuculo near Bango, but a rather rare flowerer, April 1856. No. **233**. Berries scarlet, 8 May, 1856. Coll. Carp. 1016. Very plentiful on shaded ground in dense woods by the spring of Capopo, but through three years never seen in flower. In leaf Sept. 1855. No. **235**. A unique specimen.

Pungo Andongo.—A decumbent herb with stem becoming somewhat woody, leaves coriaceous, bright green, paler beneath. Spathe herbaceous-green, straight, cylindrical, abbreviated, gaping at the top. Spadix clavate-cylindrical, whitish-yellow, equal in length to the spathe or a little shorter, slightly exserted at the top. Ovaries few, occupying $\frac{1}{3}$ or $\frac{1}{2}$ of the spadix, brownish or dull green, more or less angled, free, unilocular, stigma sessile, subpeltate or patelliform and somewhat excentric. Shady places in the woods of Mata de Quilanga near streams. In fl. 14 Feb. 1857. No. **234**. Very shady woods on the islands of Calemba in the river Cuanza, very plentiful, but not seen in flower. March 1857. No. **234**$^2$. A unique specimen.

2. **C. angolensis** Welw. ex Schott in Journ. Bot. 1865, p. 35; Engl., *l.c.*; Durand & Schinz, *l.c.*

Golungo Alto.—Stem very high-climbing woody, leaves coriaceous, shining above, glaucous and paler beneath, spathe snow-white, resembling that of *Calla palustris*, spadix yellow, berries scarlet, one-seeded. Always climbs perpendicularly on tree-trunks, often 60 to 80 ft. high; the woody stem retains, even when old, its bright green colour. One of the greatest ornaments of the primitive woods of Upper Angola, occurring generally with *Platycerium angolense*, high climbing species of *Asparagus* and smaller epiphytic ferns. Plentiful in damp shady primæval woods, climbing to a great height on the trees throughout the whole district, especially in the Sobato de Bumba and Alto Queta. In fl. May 1855. No. **239**. In fr. July 1856 in woods near Sange. No. **239**$^2$. Fruiting top of an individual, 30 ft. high, climbing vertically on the trunk of a *Sterculia* in primitive woods near Bango-Aquitamba, called Quisuculo, Sept. 1855, the ripe fruit scarlet, as big as a small pea. No. **239**$^3$.

Pungo Andongo.—High trunks in the woods of Quilunga, but less plentiful than in Golungo. In fl. March 1857. No. **240**.

10. **AROIDES** Heister ex Fabric. Enum. Pl. (Ed. 2.) p. 42. (1763).

*Richardia* Kunth; Benth. & Hook. f. Gen. Pl. iii. p. 982.

1. **A. hastatum** O.K. (*Arodes*) Rev. Gen. Pl. p. 740 (1891).

*Richardia hastata* Hook. Bot. Mag. t. 5176 (1860); Engl. in DC. Mon. Phan. ii. p. 328. *Zantedeschia hastata* Engl. Bot. Jahrb. iv. p. 64 (1883); Durand & Schinz, Consp. Fl. Afr. v. p. 477.

Huilla.—A pleasing tuberculose herb, 1 to 3 ft. high, with the habit of *A. æthiopicum*, but spathes much smaller, deep sulphur-coloured at the base, and blood-red inside. Leaves green, becoming glaucous beneath. Somewhat plentiful in marshes by banks of streams near Lopollo at an elevation of 5000 ft. In fl. Nov. and Dec. 1859. Nos. **232**, **232**[2]. Wet spongy places at the great lake of Ivantâla, of lower growth and flowering later. Feb. 1860. No. **232**[3].

2. **A. angustilobum** O.K. (*Aroides*), *l.c.*

*Richardia angustiloba* Schott in Journ. Bot. 1865 p. 35; Engl. in DC. Mon. Phan. ii. p. 329. *Zantedeschia angustiloba* Engl. Bot. Jahrb., *l.c.*; Durand & Schinz, *l.c.*

Pungo Andongo.—A fine herb, 4 to 5 ft. high, perennial with a large oblong tuber. Leaves as much as 5 ft. long. Plentiful in deep ponds between the islands of Calemba and Quisonde on the right of the river Cuanza. In fr. March 1857. No. **230**. Coll. Carp. 1020.

Material insufficient for determination.

Pungo Andongo.—An acaulescent herb, with a single leaf decompound above, spathe very large, with the spadix 2 to 2½ feet. Fruit elliptical, baccate, scarlet. Woods of Barranco de Catete. In fr. May 1857. Coll Carp. 1021.

## XXI. LEMNACEÆ.

1. **LEMNA** L.; Benth. & Hook. f. Gen. Pl. iii. p. 1001.

1. **L. æquinoctialis** Welw. Apont. p. 578 (1859).

*L. angolensis* Welw. ex Hegelmaier in Journ. Bot. 1865 p. 112; Hegelm. Lemnac. p. 141 (1868); Durand & Schinz, Consp. Fl. Afr. v. p. 484; Hegelm. in Engl. Bot. Jahrb. xxi. p. 296 (1895).

Loanda.—The small fronds 3 to 4 together, each with one rhizoid, ovate-elliptical, smooth, somewhat fleshy, slightly convex, obtusely longitudinally keeled on the upper face, ellipsoid at both ends, minutely but distinctly corniculate; flowers emerging from a marginal slit. Grows in great quantity and very rapidly, covering large ponds in a few days with a very dense growth 3 to 5 in. thick. The fertile fronds with the seeds sink to the muddy bottom, where they germinate in next year's rains, or if the rains fail will last for years without hurt. Plentiful in deep ponds after the rains at Museque de Luiz Gomez, Loanda. In fl. and fr. 10 Jan., 1858. No. **206**.

2. **L. paucicostata** Hegelm. Lemnac. p. 139, t. viii. (1868), and in Engl. Bot. Jahrb., *l.c.*, p. 294; Durand & Schinz, *l.c.*, p. 485.

*L. minor* Hegelm. in Journ. Bot. 1865, p. 112 (non L.).

Ambriz.—Near *L. minor* but differs in habit, obovate-elliptical fronds, etc. Flowers not seen. Plentiful in lakes (Lagoa de Quizembo) on the right of the river Loge and in almost stagnant streamlets near Ambriz. Nov. 1853. No. **208**.

Loanda.—Plentiful growing with *Wolffia repanda* in deep ponds near Bemposta. March 1854. No. **205** (in part).

Icolo e Bengo.—Floating or resting on floating plants or drying mud, with the habit of *L. minor*, but has markedly elliptical fronds and seems different in other respects. In a lake called Lagoa de

Quilunda near Prata, growing with *Pistia*, Nymphæeæ, etc. 14 Sept. 1854. Somewhat scarce among fronds of *Azolla pennata* R. Br. (Welwitsch herb. No. **37**) in lakes in the Libongo district, on the left bank of the river Lifune. Sept. 1858. No. **213**.

Mossamedes.—Fronds obovate-elliptical, with a short but evident longitudinal keel on the upper surface. Anthers didymous. Plentiful in deep ponds at the mouth of the river Giraûl and near Aguada. In fl. 18 July, 1859. No. **207**.

2. **WOLFFIA** Horkel; Benth. & Hook. f. Gen. Pl. iii. p. 1001.

1. **W. cylindracea** Hegelm. Lemnac. p. 123, t. 1, figs. 14, 15 (1868), and in Engl. Bot. Jahrb. xxi. p. 302 (1895).

*Telmatophace cylindracea* Welw. ex Hegelm. Lemnac. *l.c.*

Libongo.—Floating, densely gregarious, deep green, shining, rootless; fronds cylindrico-elliptical, somewhat convex on both faces, the longitudinal diameter twice the transverse, apices somewhat obtuse; offshoots growing out at the ends of the longitudinal diameter of the frond from its southern axis. Flowers and fruit vainly sought. In rocky pools on the mountains behind the Banza de Libongo, in the purest, freshest drinking-water, where no other water-plant grows. Sept. 1858. No. **212**.

2. **W. Michelii** Schleid. Beitr. Botan. i. 229 (1844).

*W. arrhiza* Wimm. Fl. Schles. 1857, p. 140; Hegelm. in Journ. Bot. 1865, p. 113, Lemnac. p. 124, and in Engl. Bot. Jahrb., *l.c.*, p. 301; Durand & Schinz, Consp. Fl. Afr. v. p. 485.

Barra do Dande.—Plentiful and gregarious in lakes on the left of the river Dande, near Bombo, about 8 geographical miles from the river mouth. In fl. end of Sept. 1858. No. **210**.

Icolo e Bengo.—Lagoa de Quilunda, near Prata, along with *Pistia* and Nymphæeæ. Found in such enormous quantities that it is collected in baskets with the *Pistia*, which is as plentiful, and used as manure. 14 Sept. 1854. No. **211**.

3. **W. reparda** Hegelm. in Journ. Bot., *l.c.*, Lemnac. p. 129, t. 4, figs. 20-30, and in Engl. Bot. Jahrb., *l.c.*; Durand & Schinz, *l.c.*

Loanda.—Fronds oblong-ovate or ovate, a little larger than those of *L. minor*, convex on both faces, bearing near the edge on the lower face a process twice as long as the frond. Flowers on the back of the frond as in *W. arrhiza*. Plentiful, mixed with *Lemna paucicostata* in deep ponds near Bemposta. In fl. and fr. March 1854. No. **205** (in part).

4. **W. Welwitschii** Hegelm. in Journ. Bot., *l.c.*, p. 114, Lemnac. p. 130, t. 4, figs. 1-10, and in Engl. Bot. Jahrb., *l.c.*, p. 300.

*W. conguensis* Welw. ex Trimen Journ. Bot. 1866, p. 221.

Ambriz.—Fronds large for the genus, exceeding *Lemna polyrrhiza* in diameter, very thin, pale green, pellucid, rootless, sometimes floating, sometimes resting on the river mud. Flowers on the back of the leaf as in *Wolffia arrhiza*, but fruit sought in vain. Growing with other species of the Order, and with Nymphæeæ in the lakes of Quizembo, and in sluggish streams near Ambriz. In fl. but without fr. Nov. 1853. No. **209**.

## XXII. ALISMACEÆ.

1. **LIMNOPHYTON** Miq.; Benth. & Hook. f. Gen. Pl. iii. p. 1005.

1. **L. obtusifolium** Miq. Fl. Ind. Bat. iii. p. 243 (1855); Micheli in DC. Mon. Phan. iii. p. 39 (1881); Durand & Schinz, Consp. Fl. Afr. v. 487.

Icolo e Bengo.—Inner perianth-leaves rose-white, anthers yellow; fruits obliquely obovate, anteriorly crested, leaves long-stalked ovate or triangular-sagittate, lobes acute, with obtuse or acute apex, glaucescent like the scape and scarcely exceeding the flowering spikes. Plentiful at the muddy marshy edges of Lagôa de Funda, near Funda, along with *Desmanthus*, *Cyperus articulatus*, etc. 13 Sept., 1854. No. **3010**.

## XXIII. JUNCAGINEÆ.

1. **TRIGLOCHIN** L.; Benth. & Hook. f. Gen. Pl. iii. p. 1012.

1. **T. bulbosum** L. Mant. p. 226 (1771); Micheli in DC. Mon. Phan. iii. p. 99 (1881); Durand & Schinz, Consp. Fl. Afr. v. p. 490.

Huilla.—A bulbous herb, with greenish flowers. Plentiful in boggy pastures and on the banks of the river of Lopollo, and near Ohai (Hai). In fl. and fr. Nov. Dec. 1859, Jan. 1860. No. **3017**.

2. **T. striatum** Ruiz & Pav., Fl. Peruv. iii. p. 72 (1802); Micheli *l.c.*, p. 101; Durand & Schinz, *l.c.*, p. 491.

Mossamedes.—A perennial herb, a foot long, leaves flattened, rather thick, herbaceous-green and erect like the smooth slightly rounded scape. Perianth-leaves almost greenish, orbicular-ovate, somewhat concave, thick and fleshy. Capsules obtusely trigonous (the alternate carpels becoming aborted), trilocular, loculi one-seeded. Seeds erect, straight, narrow-elliptical, polished, white, with raphe extending from the hilum to the apical chalaza. Rather rare in brackish swamps with Salicorneæ, *Cressa* and Scirpoideæ, near Aguadas, between Mossamedes and Cavalheiros not far from the sea. In fr. end of June, 1859. No. **3016**.

## XXIV. APONOGETONACEÆ.

1. **APONOGETON** Thunb.; Benth. & Hook. f. Gen. Pl. iii. p. 1013.

1. **A. abyssinica** Hochst. ex A. Rich. Tentam. Fl. Abyss. ii. p. 351 (1851); Engl. Bot. Jahrb. viii. p. 270 (1887); Durand & Schinz, Consp. Fl. Afr. v. p. 491.

Pungo Andongo.—A tuberous acaulescent herb, with floating leaves, and golden-yellow or white scented flowers borne on a long scape 2 to 3 inches above the surface of the water. Fruits green. Tubers eaten by the natives. Floating on ponds near the banks of the river Cuanza, near Sansamanda, and elsewhere. In fl. and immature fr. middle of Feb. 1857. No. **3011**.

2. **A. spathacea** E. Mey. in Drège, Zwei Pflanz. Docum. p. 165 (Beigab. zur Flora 1843, Bd. ii.) (nomen nudum); Hook. f. sub Bot. Mag. 6399 (1878); Engl., *l.c.*, p. 272; Durand & Schinz, *l.c.*, p. 493.

Pungo Andongo.—A marsh herb with edible tuber, suberect or spreading herbaceous-green leaves, and deep blue or violet-blue flowers. Scapes at first erect, becoming somewhat decumbent in fruit. Plentiful in marshy places between Condo and Quisonde, in damp meadows flooded in summer, between Pungo Andongo and Quisonde, and in boggy meadows between Quibinde and Quitage. In fl. and immature fr. March 1857. No. **3012**.

## XXV. POTAMOGETONACEÆ.

1. **POTAMOGETON** L.; Benth. & Hook. f. Gen. Pl. iii. p. 1014.

1. **P. fluitans** Roth. Tent. Fl. Germ. i. p. 72 (1788).

*P. natans* L. var. *fluitans* Cham. Adnot. Fl. Berol. p. 4 (1815); Durand & Schinz, Consp. Fl. Afr. v. p. 495.

Huilla.—Somewhat rare in pools of streams; not seen in flower. Mumpulla, Oct. 1859. Vainly sought in the same place June 1860. No. **249**.

2. **P. pectinata** L. Sp. Pl. p. 127 (1753); Kunth Enum. iii. p. 137 (1841); Durand & Schinz, *l.c.*

Mossamedes.—Floating in deep fresh water, almost always growing with *Typha angustifolia*. Deep ponds near Aguadas. With no fl. or fr. July 1859. No. **250**.

3. **P. javanica** Hassk. in Act. Soc. Scient. Indo-Neêrland. i. (Art. 8), p. 26 (1856); Durand & Schinz, *l.c.*

*P. huillensis* Welw. ex Schinz in Ber. Schweiz. Bot. Ges. i. p. 61 (1891).

Huilla.—Streams near Catumba with species of *Ottelia* and *Limnophila*, but very rarely flowering. In fl. Apr. 1860. No. **248**.

2. **RUPPIA** L.; Benth. & Hook. f. Gen. Pl. iii. p. 1014.

1. **R. maritima** L. Sp. Pl. p. 127 (1753); Kunth Enum. iii. p. 123; Durand & Schinz, Consp. Fl. Afr. v. p. 497.

Pungo Andongo.—Nutlets 3 to 6, with unequal peduncles, ovate, gibbous, polished. In a slowly flowing salt stream at Salinas do Dungo (Soba Canhôro). In fr. and with a few flowers, middle of March 1857. No. **245**.

3. **ZOSTERA** L.; Benth. & Hook. f. Gen. Pl. iii. p. 1017.

1. **Z. nana** Roth. Enum. Pl. Germ. i. p. 8 (1827); Kunth Enum. iii. p. 117 (1841).

*Z. minor* Nolte ex Kunth *l.c.*; Durand & Schinz, Consp. Fl. Afr. v. p. 499.

Ambriz.—Plentiful near the mouth of the river Loje, near Ambriz. Without fl. Nov. 1853. No. **246**[b].

Loanda.—Plentiful all along the shores of Angola; never seen in flower. Praia de Zamba Grande, 4 Dec. 1853. End of June 1858. No. **246**.

4. **NAJAS** L.; Benth. & Hook. f. Gen. Pl. iii. p. 1018.

1. **N. Welwitschii** Rendle sp. nov.

*Najas* sp. Magnus Beitr. Gatt. Najas, pp. 44, 45, t. v. fig. 18 (1871).

A bright green shining herb, with spreading shoots; leaves flat, linear-tapering, spreading when alive, the margin bearing numerous ascending, somewhat prominent teeth, the sheath broadly rounded or truncate, asymmetrical, with numerous small teeth on the upper edge; intravaginal scales subulate; flowers solitary, unisexual, enveloped in an oval spathe with a cylindrical spiniferous or dentate neck; anther quadrilocular; stigmas two; fruit enclosed in the persistent spathe; seed-coat distinctly marked with about twenty-five rows of four-sided pits.

Shoots to 12 in. long, lower internodes $1\frac{1}{2}$ to 2 in. by $\frac{1}{2}$ line wide, decreasing in the branches. Leaf-blades generally $\frac{3}{4}$ to 1 in. long by about $\frac{1}{4}$ line broad; marginal teeth 12 to 16, somewhat broadly triangular and ending in an ascending brown spine, about half the leaf-width in length in the middle of the blade. Sheaths about 1 line long and nearly or quite as broad. Male flowers subsessile, nearly $1\frac{1}{2}$ line long, female about 1 line. Seed $1\frac{1}{4}$ line long by $\frac{1}{3}$ line in diameter, very pale brown. Near *N. Schweinfurthii* Magnus, but distinguished by its rounded leaf-sheath, quadrilocular anther, etc.

Barra do Dande.—A bright green lucidulous herb, floating at the bottom of water, generally not very deep and attached in the mud by a rhizome bearing long fibres; stiffish when alive but soon becoming flaccid on exposure to air. Leaves spinulose-denticulate, spreading, with scarcely or slightly recurved tip. Lakes called Lagoas de Bombo, on the left of the river Dande. In fr. end of Sept. 1858. No. **247**[b].

Barra do Bengo.—At the great lake Lagoa de Quifandongo (otherwise Quifangondo), near Quisequele. Without fl. Nov. 1853; in fr. Jan. 1854. No. **247**.

## XXVI. ERIOCAULACEÆ.

1. **ERIOCAULON** L.; Benth. & Hook. f. Gen. Pl. iii. p. 1020.

*Dichrolepis* Welw. Apont. p. 542 (1859).

1. **E. huillense** Rendle sp. nov.

Glabrous; stem suppressed; leaves very short, subulate, acute; scapes numerous, filiform, quadrangular, compressed; sheath with a long oblique mouth and generally blunt entire apex; flower-heads subglobose when ripe, black, monœcious, with female flowers on the outside, and male and female mixed in the centre; receptacle oblong, pilose; involucral bracts fuscous, obovate or obovate-oblong, apex rounded; floral bracts fuscous, obovate, apex rounded or shortly apiculate, concave; flowers dimerous; female sessile, sepals olive-green with a broad membranous keel as large or almost as large as the rest of the sepal, the whole forming a more or less asymmetrical rhomboideo-flabelliform structure, apex apiculate, upper edge irregularly denticulate, upper edge of keel grossly dentate and irregularly denticulate; petals close above

the sepals, narrowly cuneate, apex rounded or shortly and irregularly bifid, glands absent; ovary transversely oblong with slightly retuse base and apex, 2-celled, styles 2, filiform, exceeding the petals; male shortly stalked, sepals linear or cuneately oblong with rounded or irregularly dentate apex, succeeding internode shorter than the sepals; petals rudimentary, triangular; stamens 4, anthers black; carpel-rudiments 2, shortly stalked, black.

Plants 1 to 5 in. high, leaves 2 to 8 lines long by $\frac{1}{2}$ line or less broad; scapes from less than 1 in. to $4\frac{1}{2}$ in.; sheath 3 to 10 lines; ripe flower-heads 1 to 2 lines in diameter; involucral bracts $1\frac{1}{3}$ to $\frac{2}{3}$ line long by about $\frac{1}{3}$ line or less in breadth; floral bracts $\frac{2}{3}$ line long and about half as broad; sepals of female flower about $\frac{1}{2}$ line each way, internode between sepals and petals nearly $\frac{1}{6}$ line, petals $\frac{1}{2}$ by $\frac{1}{6}$ line; pedicel of male flower $\frac{1}{6}$ line long; sepals scarcely $\frac{1}{2}$ line; pedestal above sepals $\frac{1}{3}$ line. The above measurements of bracts and flowers are taken from one of the larger full-grown heads.

A very distinct species.

Huilla.—In almost boggy wooded marsh-meadows growing very plentifully with Gentianaceæ and species of *Drosera* between Lopollo and Monino. Heads very black. March, April, and May 1860. No. **2448**. Various forms differing in age and size of head. On boggy shortly grassed slopes densely packed with species of *Scytonema*, plentiful along with a terrestrial species of *Isoetes*. Heads black. April and May 1860. No. **2449**. A poor form. Occurs rather sparsely on the very lofty very short-grassed pastures of Empalanca, which are flooded in summer. Heads black or blackish. April 1860. No. **2450**.

2. **E. longipetalum** Rendle sp. nov.

A dwarf plant with somewhat the habit of stunted forms of *Juncus pygmæus*; leaves numerous, rigidulous, very narrowly subulate, long-pointed, glabrous, surrounding and exceeding the numerous crowded scapes; scapes subcompressed, subquadrangular, shortly hairy at the base, exceeding the subacute or shortly bifid sheath which is closed for one-fourth its length and is also hairy at the base only; flower-heads bell-shaped, pale greenish-white, monœcious, few- often 10-flowered having a central male surrounded by females; receptacle truncated obconical, glabrous; flowers dimerous; involucral bracts slightly exceeding the disc, oblong, with a more or less oblique, truncate, or irregularly bifid often irregularly denticulate apex and a subtruncate base, glabrous, lucent; floral bracts of female flower similar but shorter; flower sessile, lyre-shaped; sepals glabrous, sometimes slightly unequal, boat-shaped, keeled, linear-falcate, tapering shortly to an acute, subacute or obtuse minutely denticulate apex, keel as wide as the side of the sepal, narrowing above and below, edge slightly uneven; petals glabrous, very unequal, the longer strap-shaped, projecting laterally from the top of the flower, twisting at the middle, with erose or bluntish apex, the shorter generally similar in form, sometimes very small, not exceeding the ovary, and lanceolate; ovary broadly ovate, style dividing below the middle

into 2 filiform arms longer than the sepals; male flower subtended by broadly elliptical concave glabrous bracts with truncate erose apex, stalked; sepals small, triangular-subulate, free; petals minute, alternating with the sepals; stamens 4, anthers black; 2 minute black carpel-rudiments are found in the centre; seeds elliptical with a flat side, pale red-brown with a yellowish reticulation.

Plants $\frac{1}{4}$ to $\frac{1}{2}$ in. high with a close, button- or rosette-like habit; leaves densely rosulate, 3 to 8 lines long, not exceeding $\frac{1}{3}$ line in breadth above the base; scape 5 lines long or less, sheathed for three-fourths its length, sheath sometimes becoming ultimately trifid. Flower-heads 1 line or less in diameter; involucral bracts 1 line long, or slightly less, by $\frac{1}{4}$ line broad; floral bracts of female flowers $\frac{4}{5}$ to $\frac{2}{3}$ line by $\frac{1}{4}$ to $\frac{1}{3}$ line; sepals $\frac{2}{3}$ to $\frac{2}{3}$ line by $\frac{1}{8}$ line in side view; petals close above the sepals, the larger a little over 1 line by $\frac{1}{10}$ line, the smaller $\frac{1}{3}$ to $\frac{2}{3}$ line long; male bracts $\frac{1}{2}$ by $\frac{1}{3}$ line, pedicel $\frac{1}{6}$ line, sepals $\frac{1}{3}$ line or slightly less.

A distinct little species characterised by its dense congested habit and the long protruding petal of the female flower.

HUILLA.—A dwarf plant with the facies of *Juncus pygmæus*, congested rosulate radical leaves, crowded scapes shorter than or equal to the leaves, and small whity-greenish flower-heads, growing almost immersed in sticky mucus derived from Algæ, on the boggy heights of Morro de Lopollo; middle of May 1860. No. **2446.**

3. **E. Welwitschii** Rendle sp. nov.

*Dichrolepispusilla* Welw. Apont. p. 542 (1859).

Glabrous; stem suppressed; leaves less than half the length of the scape, linear-tapering, acute; scapes numerous, filiform, flexuose, subelliptical in section; sheath slightly hairy at the base, united for $\frac{4}{5}$ its length, apex bifid; flower-heads ultimately subglobose or with a slightly flattened base, subfuscous, monœcious, peripheral florets female; receptacle oblong to oblong-conical, pilose; flowers trimerous; involucral bracts whitish-stramineous, lanceolate, acute to acuminate; floral bracts similar becoming slightly smaller; female flowers sessile, sepals whitish, transparent, broadly linear to linear-oblong and lanceolate, narrowing above to an aristate apex, concave; petals close above the sepals, filiform; style passing into 3 subulate arms far exceeding the perianth; male subsessile, sepals whitish, transparent, linear-lanceolate, acute or subacute, free or more or less connate below; petals rudimentary, stamens 6, anthers black.

Plants 3 to 4 in. high, leaves $\frac{1}{2}$ to $1\frac{1}{2}$ in. long, reaching about $\frac{1}{2}$ line in breadth above the base, scapes $1\frac{1}{2}$ to nearly 4 in., sheaths 4 to 8 lines long. Flower-heads 1 to $1\frac{1}{2}$ lines across; involucral bracts $\frac{3}{4}$ by $\frac{1}{4}$ line; sepals of female flower $\frac{1}{2}$ by $\frac{1}{8}$ to $\frac{1}{6}$ line; petals $\frac{5}{12}$ line; sepals of male flower $\frac{5}{12}$ by $\frac{1}{10}$ to $\frac{1}{12}$ line, pedestal between sepals and petals $\frac{1}{3}$ line.

Near *E. abyssinicum* Hochst. but distinguished by its narrower and narrowly pointed bracts, markedly hairy receptacle, etc.

PUNGO ANDONGO.—Plentiful, but seen in one place only, in boggy

scantily grassed places with species of Lythraceæ between Lombe and Candumba. In fl. and immature fr. end of March 1857. No. **2441.**

Var. **pygmæum** Rendle.

A dwarf congested form with almost glabrous receptacle.

HUILLA.—Flower-heads subfuscous within, whitish outside. Widely cæspitose in damp sandy fields which in the previous year had been planted with *Sorghum* and *Penicillaria*. Near Lopollo; April and May 1860. No. **2444.**

4. **E. ciliisepalum** Rendle sp. nov.

Small; glabrous; stem suppressed; leaves shorter than the scapes, linear-tapering, acute, flaccid; scapes several to each plant, filiform, erect or spreading, compressed triangular in cross section, sheath rather short, thinly membranous, united below the oblique mouth, blunt; flower-heads hemispherical when young becoming globose with a truncate base, disc black, involucre whitish, monœcious, flowers trimerous, the outer female, the inner male, receptacle oblong, hairy; involucral bracts elliptic to elliptic-ovate, blunt or subacute, glabrous; floral bracts ovate or elliptical to oblong-lanceolate, sometimes narrowly rhomboid, apex acute, glabrous; female flowers sessile, sepals very concave, lanceolate, acute, with sparsely ciliate margins; internode between sepals and petals very short, petals narrowly linear, acute; ovary trigastrous, style dividing a little above the base into three arms which overtop the petals; male flowers shortly stalked, sepals united into a glabrous funnel-shaped tube open on one side, with irregularly dentate, sometimes bifid or trifid apex; petals rudimentary, triangular-ovate with a small blackish gland below the apex; stamens 6, anthers blackish; pistil represented by three minute blackish glands.

Plants cæspitose, $\frac{1}{2}$ to $1\frac{1}{4}$ in. high, leaves not exceeding 8 lines long by $\frac{1}{3}$ line broad above the base; scapes generally between $\frac{1}{2}$ and 1 in., sheath $\frac{1}{3}$ in. or less. Flower-heads $\frac{1}{2}$ to $1\frac{1}{3}$ lines across; involucral bracts $\frac{2}{3}$ by $\frac{1}{3}$ line; floral bracts $\frac{2}{3}$ to $\frac{1}{3}$ by $\frac{1}{4}$ to $\frac{1}{5}$ line; sepals of female flower $\frac{3}{5}$ line by $\frac{1}{6}$ line across the back, petals $\frac{1}{2}$ line long. Pedicel of male flower $\frac{1}{10}$ line, pedestal between calyx and petals scarcely $\frac{1}{3}$ line.

Near *E. abyssinicum* Hochst. but distinguished by its hairy receptacle and the ciliate sepals of the female flower.

HUILLA.—In damp fields formerly planted with *Zea Mays*; very plentiful but only met with in very few places; near Lopollo at 5000 feet elevation; May 1860. No. **2445.** On mucous-boggy slopes at Morro de Lopollo, below the old fortress; end of May 1860. No. **2445***b*.

5. **E.** sp.

Perhaps a new species near *E. abyssinicum*, distinguished by its much broader triangular-subulate, fenestrate leaves. Flower-heads with whitish involucre and blackish discs; flowers trimerous but too young for more certain determination.

HUILLA.—In lofty short-grassed pastures flooded in the rainy season at Morro de Lopollo, growing with small *Xyrideæ* and *Cyperaceæ* but not plentiful. March and April 1860. No. **2451.**

6. **E. lacteum** Rendle sp. nov.

A handsome plant sometimes 1½ ft. high; stem suppressed; leaves short, glabrous, densely rosulate, ensiform, blunt, the lower part inconspicuously fenestrate; scapes several to a plant, tall, erect, wiry, twisted, subterete with 5 to 8 longitudinal ridges; sheath about twice as long as the leaves, longitudinally striate and twisted, broadening and with split edges for ⅓ of its length or less below the scarious shortly bifid easily broken apex; flower-heads white, densely hairy, depressed globose, the smaller male, the larger consisting of numerous male flowers surrounding a few females; receptacle convex, villous; involucral bracts straw-coloured, more or less fuscous above the middle, broadly oblanceolate and blunt, or lanceolate and, especially the inner, subacute to acute; outer floral bracts straw-coloured with often a fuscous apex, broadly oblanceolate, subacute to acuminate, slightly hairy, the inner spathulate, shortly acuminate, apex thickened, shortly and densely hairy; flowers trimerous, female sessile, sepals cuneate, flat or slightly concave, apex rounded bearing short white hairs; petals close above the sepals, narrowly cuneate, hairy above the middle ending in an apical tuft of white hairs, with a black bottle-shaped gland below the apex, the odd petal larger; ovary trigastrous, styles 3, filiform, almost as long as the odd petal; male flowers sessile, sepals unequal, concave inwards, cuneate with rounded thickened apex, bearing a short white tomentum on the back in the upper third; lateral petals shortly linear-cuneate with a white tomentum on the upper face and apex, the odd one larger, narrowly cuneate with upper face densely tomentose, each bearing a central black ovate-conical gland; stamens 6, anthers black; pistil represented by 3 black central glands.

Plants 7 to 18 in. high; leaves 1 to 1¾ in. long by 1½ to 2 lines broad above the broad sheathing base; scapes 9 to 18 in. long; sheath 1½ to 2½ in. Flower-heads ¾ to 4½ lines in diameter; involucral bracts 1 to 1¼ by a little over ½ line, floral bracts 1½ to 1 by ¾ to ½ line; sepals of female ⅘ to 1 by ⅓ to nearly ½ line; internode between calyx and corolla ⅕ line; larger petal 1¼ by ½ line, others ⅘ by ⅕ line; sepals of male ⅘ to 1 by ¼ to scarcely ½ line; pedestal between calyx and corolla ¾ line long, the larger petal a good line long and half as broad, others ¾ by ¼ line.

Near *E. Sonderianum* Körn., but distinguished by its blunt leaves, the absence of keel or wing on the sepals, etc.

Huilla.—Widely cæspitose, with tall sheaths and milk-white heads. Plentiful in damp meadows, growing among Droseraceæ and species of *Utricularia*, and very plentiful in swampy places round Lopollo; Feb. to May 1860. Collected by Welwitsch in swampy meadows not farther than 300 paces from his house in April 1860. No. **2452**. Growing somewhat sparsely in the very lofty spongy pastures of Morro de Lopollo along with *Swertia* stellarioides and small Leguminosæ; end of April 1860. No. **2452***b*. On the higher spongy slopes of Serra de Oiahoia in the Humpata district; towards the end of April 1860. No. **2453**.

7. **E. andongense** Welw. ms. in herb.

Glabrous, somewhat fleshy, subglaucous-green becoming yellowish-green when older; leaves radical, ensiform, acute, rosulate, erecto-patent, somewhat conspicuously fenestrate when dried; scapes numerous, subfiliform, compressed-quadrangular; sheaths slightly shorter than the leaves, margins united to within a short distance of the oblique subacute tip; flower-heads compact, subglobose when ripe, fuscous, monœcious, peripheral flowers female, inner male, all trimerous; receptacle villous, bracts and perianth-leaves glabrous; involucral bracts shorter than the disc, bluntly obovate or subacute, pale straw-coloured and shining; floral bracts oblanceolate, acute, fuscous; female flowers on a short villous pedicel, 2 sepals larger, boat-shaped, keeled, acute, broadly falcate in side view, the third shorter, narrowly oblanceolate, bluntish, almost flat; internode between calyx and petals very short; odd petal larger, linear-lanceolate, with bifid apex, the others linear enlarging upwards, with a blunt irregularly crenate apex; ovary trigastrous, the 3 filiform styles slightly exceeding the long petal; seeds elliptical, striolate, male flowers shortly stalked, calyx funnel-shaped, sepals obliquely oblanceolate, blunt, free or 2 more or less connate in the lower half; petals rudimentary, anthers 6, 2-celled, black.

Plants 5 to 8 in. high; leaves $\frac{2}{3}$ to 2 in. long by $\frac{1}{2}$ to $1\frac{1}{2}$ lines broad, scapes reaching 8 in., heads $1\frac{1}{2}$ to 2 lines across. Involucral bracts 1 line by $\frac{1}{2}$ line, floral bracts a little over 1 line by between $\frac{1}{3}$ and $\frac{1}{2}$ line; pedicel of female flower $\frac{1}{6}$ line, the larger sepals $\frac{3}{4}$ by $\frac{1}{6}$ line, the third slightly shorter; internode $\frac{1}{8}$ line, large petal $\frac{3}{4}$ by $\frac{1}{8}$ line, smaller petals $\frac{1}{2}$ line long. Stalk of male flower $\frac{1}{5}$ line long.

Near *E. transvaalicum* N.E.Br. but distinguished by its lighter flower-heads, glabrous bracts and perianth-leaves, broader sepals of female flower, etc.

Pungo Andongo.—Growing gregariously in spongy places on the higher rocks of Pedra de Cazamba in the præsidium; beginning of May 1857. No. **2442**. Rather plentiful in spongy rocky places by springs on the huge rocks towards the south of the præsidium. Fonte de Salgado; middle of April 1857. No. **2443**. Wet places by the cataract of Condo (De Estefania). Not yet in fl.; March 1857. No. **2443***b*.

8. **E. submersum** Welw. ms. in herb.

A submerged glabrous annual herb, with numerous densely rosulate, linear-filiform, long-pointed leaves, spreading under water in the form of a vividly green star, soon becoming extremely flaccid when exposed to the air; scapes numerous, crowded in the centre, erect, stiffish, 5- to 7-angular, flattened when dried; sheath shorter than the leaves, edges united to within a short distance of the thinly membranous, easily broken, often bifid or trifid apex; flower-heads compact, depressed-globose, black, with a sparse whitish puberulence, monœcious, male and female flowers mixed, trimerous; receptacle discoid, slightly hairy; involucral bracts glabrous, obovate-spathulate with very blunt or rounded apex;

floral bracts glabrous, oblanceolate-spathulate, the outer obtuse, the inner becoming acute; female flowers on a short glabrous pedicel, sepals obovate, boat-shaped, acute, slightly keeled with a few short white hairs on the upper part of the back, unequal, the outermost the largest; petals close above the sepals, fuscous, narrow-linear, tapering downwards, apex blunt, irregular, often bearing a few very short hairs, but no glands; ovary trigastrous, style with three filiform branches as long as the petals; seeds pale brown, striolate; male flowers on glabrous pedicels, sepals linear, free or unequally connate below, apex blunt or irregularly broken, often with a few short white hairs, pedestal above, the calyx about $\frac{2}{3}$ to $\frac{3}{4}$ length of the sepals; petals rudimentary, ovate-triangular; stamens 6, anthers black.

Plants said to be completely submerged, flowering and fruiting beneath the surface, 8 to 14 in. high. Leaves 2 to 4 in. in length by about $\frac{1}{3}$ line greatest width; scapes 6 to 13 in. long; sheath 2 to $2\frac{1}{4}$ in. Mature flower-heads $2\frac{1}{2}$ to $3\frac{1}{2}$ lines across; involucral bracts $\frac{5}{6}$ to 1 by $\frac{2}{3}$ to $\frac{1}{2}$ line; floral bracts 1 by nearly $\frac{1}{2}$ line. Stalk of female flowers $\frac{1}{6}$ line long, sepals $\frac{5}{6}$ to 1 line, petals about 1 line; stalk of male flower $\frac{1}{4}$ line long, sepals scarcely $\frac{2}{3}$ line by $\frac{1}{10}$ to $\frac{1}{8}$ line, the broader ones concave.

Near the last species but distinguished by its submerged habit, very narrow leaves, black heads, etc.

HUILLA.—Here and there by a large pond near the banks of the river Mupanda. A few poor specimens collected during flight; Feb. 1860. No. **2456**. Somewhat rare in gently flowing rather deep streams between Lopollo and Nene, flowering in autumn. Produces both flower and fruit beneath the water; end of April 1860. All the specimens seen grew at the bottom of a stream 2 to 3 ft. deep, and the plant thus seems to flower and fruit beneath the surface. On the muddy bottom of slowly flowing streams between Humpata and Lopollo, in one place only, but plentiful there; end of April 1860. No. **2457**.

9. **E. stoloniferum** Welw. ms. in herb.

A glabrous perennial stoloniferous submerged herb; leaves radical, long, linear-tapering, acute, a very bright shining green; scapes solitary or few, far exceeding the leaves, multiangular (7- or 8-), flattened when dried; sheath much shorter than the leaves, broad, with a bluntly bifid apex; flower-heads subfuscous, transversely elliptical, monœcious, flowers trimerous, the inner often viviparous; receptacle broadly truncately conical, glabrous; involucral bracts whitish, glabrous, spathulate-obovate, very blunt; floral bracts fuscous, glabrous, oblong-spathulate to spathulate, blunt; female flowers shortly pedicellate; sepals rhomboideo-obovate, concave, glabrous, fuscous; petals close above sepals, cuneate to oblong-cuneate, the apex and upper surface just below it tomentose, with a black subapical gland; ovary trigastrous, the 3 filiform stigmas exceeding the petals; seed yellowish-brown, spherico-pyriform, hilum brown, surface faintly striolate; male flowers with a short glabrous pedicel;

sepals cuneate to cuneate-oblong, obtuse, free, glabrous, fuscous; petals small, broadly oblong, with a dark short linear gland just below the shortly hairy apex; stamens 6, anthers dark.

Plants 8 to 16 in. high, flowering somewhat rarely. Long flattened stolons which root and produce new plants at the end, radiate from the centre of the leaf-rosette, and are sheathed like the scapes. Leaves laxly spreading, reaching nearly 9 in. in length, with $\frac{1}{2}$ to $\frac{3}{4}$ line greatest breadth. Scapes to 16 in. long, sheaths to $3\frac{1}{5}$ in., flower-heads 3 to 4 lines across; involucral bracts $1\frac{1}{2}$ to $1\frac{2}{3}$ by 1 or scarcely 1 line; floral bracts $1\frac{1}{2}$ by $\frac{1}{2}$ line or narrower. Stalk of female flower $\frac{1}{4}$ line long; sepals 1 by $\frac{1}{5}$ to $\frac{2}{3}$ line; petals 1 to $1\frac{1}{4}$ by $\frac{1}{3}$ line; stalk of male flower $\frac{1}{3}$ line; sepals 1 line, or a little more, by $\frac{1}{3}$ line; pedestal above calyx $\frac{1}{2}$ line long; petals $\frac{1}{2}$ by $\frac{1}{5}$ to nearly $\frac{1}{3}$ line.

Near *E. rivulare* Don, but distinguished by its narrow leaves, larger flowers with glabrous sepals, etc.

HUILLA.—A perennial entirely submerged herb, with flower-heads just emerging when mature. Plentiful in cold rather rapidly flowing mountain streams at Morro de Lopollo, but somewhat rarely flowering. Forms a widely spreading very green carpet beneath the water. A few fruiting specimens in Dec. 1859; in bud middle of May 1860. No. **2458**.

2. **PÆPALANTHUS** Mart.; Benth. & Hook. f. Gen. Pl. iii. p. 1022.

1. **P. Wahlbergii** Körn. in Mart. Fl. Bras. iii. pt. 1, p. 459 (1863); Durand & Schinz, Consp. Fl. Afr. v. p. 504.

HUILLA.—Laxly cæspitose, subflaccid, heads dull yellow. Somewhat rare in spongy *Sphagnum* bogs near streams at Morro de Monino; Jan. 1860. No. **2454**. Marshy, scarcely spongy, wooded meadows between Lopollo and Monino (or Moninho) growing with *Burmannia* and *Anagallis pulchella* Welw. (No. **276** in herb.); in fr. Nov. and Dec. 1859. No. **2455**. Heads tawny gold. Near the spongy banks of the river Quipumpunhine near Humpata. In leaf without flower; beginning of June 1860. No. **2455***b*. COLL. CARP. 1064 (no notes).

2. **P. Welwitschii** Rendle sp. nov.

A very small plant, acaulescent, with a rosette of short flat linear-tapering acute subrigid leaves generally about half the length of the scapes; scapes numerous, filiform, sparsely hairy, especially above the middle; sheath with a tuft of white hairs at the base, margins united to the middle, apex blunt; flower-heads shortly campanulate or more spreading and almost disciform, involucre shining white, disc chestnut-brown, monœcious, few-flowered with generally 5 peripheral female flowers and 2 central male; receptacle very hairy, truncately obconical; involucral bracts exceeding the disc, lanceolate to ovate, subacute, glabrous; floral bracts oblong-lanceolate to lanceolate, subacute; female flowers sessile, sepals yellowish, very concave, linear-oblong to oblong, blunt, margin sparsely pilose, the odd one sometimes shorter with a truncate base and more hairy margin; petals

spathulate, hairy on the back; style with a stout cylindrical base dividing into 3 linear-tapering arms, with no intervening sterile arms; seeds red-brown, subelliptical with a shallow point at each end; male flower subsessile, sepals concave, broadly elliptical to obovate with rounded apex, glabrous; petals connate into a short funnel round the base of the 3 stamens; anthers didymous, black.

Plants $\frac{1}{2}$ to 1 in. high; leaves 3 to 5 lines long by $\frac{1}{4}$ to $\frac{1}{3}$ line broad, or sometimes narrower; scapes $\frac{1}{4}$ to 1 in. long; sheath about half as long. Flower-heads $\frac{2}{3}$ to 1 line across; involucral bracts $\frac{2}{3}$ line long and half as broad; floral bracts $\frac{2}{3}$ by $\frac{1}{4}$ to $\frac{1}{3}$ long becoming shorter above. Sepals of female flower $\frac{2}{3}$ by $\frac{1}{8}$ line; petals $\frac{1}{3}$ by $\frac{1}{10}$ to $\frac{1}{6}$ line. Stalk of male flower $\frac{1}{10}$ to $\frac{1}{12}$; sepals $\frac{1}{5}$ line long and half as broad.

Distinguished from *P. Wahlbergii* by its pigmy size, few-flowered heads with white involucral bracts, and absence of sterile style-arms.

Huilla.—In rather damp fields formerly cultivated with *Sorghum*; a very social plant and plentiful along with pigmy Cyperaceæ and Commelynaceæ. Near Lopollo; April and May 1860. No. **2447**.

## XXVII. CYPERACEÆ.

### Tribe I. *CYPEREÆ*.

1. **KYLLINGA** Rottb.; Benth. & Hook. f. Gen. Pl. iii. p. 1045.

1. **K. pumila** Mich. Fl. Bor.-Amer. i. p. 28 (1803); C. B. Clarke in Durand & Schinz, Consp. Fl. Afr. v. p. 531.

*K. cæspitosa* Nees in Mart. Fl. Bras. ii. 1, p. 12 (1842); Ridl. in Trans. Linn. Soc. ser. 2. ii. 145 (1884) pro parte.

Golungo Alto.—Slopes of eastern Queta near the banks of the river; Dec. 1855. No. **7012***a*.

Pungo Andongo.—Dec. 1856. No. **6790** (in part). March 1857. No. **6796** (in part). Densely cæspitose with fibrous rhizome, flaccid decumbent or oblique culms, and pale greenish heads. Plentiful in the short-grassed damp more lofty mountain pastures with a species of *Cleome*, etc., near the rock Cabondo; end of Nov. 1856. No. **7153**. Younger culms erect, nodding or decumbent when in fruit. Damp rocks near the hill Cabondo on the præsidium; Nov. 1856. No. **7158**. No. **7167** (no information).

2. **K. parvula** C. B. Clarke ined.

*K. brevifolia* C. B. Clarke, *l.c.*, p. 527 (non Rottb.).

*K. cæspitosa* Nees, var. *angustifolia* Ridl., *l.c.*

Pungo Andongo.—Dec. 1856. No. **6781**.

3. **K. triceps** Rottb. Descr. and Ic. Pl. p. 14 (1773); Ridl., *l.c.*, pro parte; C. B. Clarke, *l.c.*, p. 533.

*K. cæspitosa* Ridl., *l.c.*, pro parte (non Nees).

Golungo Alto ?—No. **7005***b* (no information.)

Pungo Andongo.—By rain-swamps in spongy places between the præsidium and Quilanga; Feb. 1857. No. **6780**. Wet places at Mutollo;

end of Feb. 1857. No. **6787**. Dec. 1856. No. **6787***b*. Rhizome creeping, culms cæspitose, strictly erect, with a slightly bulbous base; heads greenish. Damp pastures near Catete; Nov. 1856. Spongy marshy places on the higher rocks towards the south of the præsidium; middle of Dec. 1856. Catete, with *Polygala africana* Chodat; beginning of Jan. 1857. No. **6791**. Rhizome slightly bulbous; heads greenish; culms strictly erect, scarcely cæspitose. Spongy wet places on the higher rocks with bulbous Liliaceæ; end of Nov. 1856. No. **7160**.

Var. **ciliata** Boeck. in Linnæa xxxv. p. 414 (1867-68); C. B. Clarke, *l.c.*

*K. cæspitosa* Ridl., *l.c.*, pro parte (non Nees).

*K. triceps* Ridl., *l.c.* (non Rottb.).

*K. Welwitschii* Ridl., *l.c.*, p. 147.

Loanda.—Cæspitose. Rather damp littoral places at Zamba Grande, but not often found; end of April 1854. No. **6793**. Plentiful in pastures with short herbage between Loanda and Penedo, not far from the sea; March 1858. No. **6995**. Cæspitose; leaves somewhat flat, erect, with a hispidulous, distantly ciliate margin; heads whitish. Short-grassed places, between Penedo and Conceiçao; beginning of May 1858. No. **6999***b*.

Pungo Andongo.—On the banks of the Cuanza near Calemba; Calemba Islands; March 1857. No. **6779**. Muta Lucala, March 1857. No. **6790** (in part). Between Lombe and Muta Lucala; March 1857. No. **6796** (in part). Damp forest-meadows between Bumba and Condo, plentiful but immature; March 1857. No. **6798**.

Benguella.—Plentiful but seen in one locality only in rather damp places grown with short herbage south of the city of Benguella, near the banks of a pond now almost dry. Beginning of June 1859. No. **6792**.

4. **K. cylindrica** Nees in Wight, Contrib. Bot. Ind. p. 91 (1834); Ridl., *l.c.*, p. 146; C. B. Clarke, *l.c.*, p. 528.

*K. triceps* Rottb. var. *obtusiflora* Boeck. *l.c.*; Ridl., *l.c.*, p. 145. Var. *longispicata* Ridl., *l.c.*, p. 146.

Sierra Leone.—Plentiful among herbage near Freetown; Sept. 1853. No. **6989**.

Golungo Alto.—On rather damp slopes and in palm-groves, Monte de Queta; Nov. 1855. No. **7005**.

Pungo Andongo.—In damp rocky pastures by the river Casalalè; middle of Jan. 1857. No. **6789**.

Huilla.—On wet slopes near streams in Morro de Lopollo on the way to Empalanca, but not plentiful; heads green. Almost past flowering; middle of May 1860. No. **6795**. Near Humpata; April and May 1860. Coll. Carp 1080.

5. **K. pungens** Link Hort. Berol. i. p. 326 (1827); C. B. Clarke, *l.c.*, p. 532.

*K. obtusata* Presl Rel. Haenk. i. p. 183 (1828); Ridl., *l.c.*

Pungo Andongo.—In wet often flooded places on the Calemba Islands in the river Cuanza near Condo; March 1857. No. **6800** (in part).

6. **K. elatior** Kunth Enum. Pl. ii. p. 135 (1837); C. B. Clarke, *l.c.*, p. 528.

*K. aromatica* Ridl., *l.c.*

Loanda.—No. **6996**.

Golungo Alto.—Culms somewhat rigid and strict. Heads green not white. Damp reedy ground near Banza de Bango. Not yet in good flower; 23 April, 1856. No. **7007**.

Pungo Andongo.—A herb 2 to 3 ft. high, with erect culms and long-involucred heads, appearing like a small palm. In the waters of the river Cuanza, near Candumba, but not plentiful; 23 Feb. 1857. A widely cæspitose herb, with creeping very tough pleasantly aromatic rhizome (almost like *Acorus Calamus*), and greenish heads. Fissures of rocks on the stream Malemba near Candumba, growing with bamboo; March 1857. No. **6801**.

7. **K. erecta** Schum. in Dansk. Vidensk. Selsk. iii. p. 62 (1828); C. B. Clarke, *l.c.*

*K. aurata* Nees in Linnæa x. p. 139 (1836); Ridl., *l.c.*

Loanda.—Rhizome horizontal, branched, culms erect, heads greenish. Plentiful round ponds in herb-grown places near Represa de Luiz Gomes; Feb. 1854. No. **6797**. Also Jan. 1858. No. **6999**.

Dande.—By the lake of Bombo; August 1858. No. **6799**.

Pungo Andongo.—Round the Lagoa de Quibinda; March 1857. No. **6800** (in part). An elegant plant, with cæspitose culms, and small solitary greenish heads. In rather sandy damp thickets near Luxillo. In spongy marshy places on the more lofty rocks towards the south of the præsidium; middle of December 1856. No. **6808**.

Huilla.—In poor shortly thicket-grown pastures near Lopollo; Feb. and beginning of April 1860. No. **6809**. Plentiful in rather damp wooded meadows on the river Cacolobar; beginning of March 1860. No. **6810**.

8. **K. monocephala** Rottb., *l.c.*, p. 13; Ridl., *l.c.*, p. 147; C. B. Clarke, *l.c.*, p. 530.

Prince's Island.—A perennial herb with grass-like rather flaccid leaves and white heads. In rather dry wooded more lofty places of the island; Sept. 1853. No. **6988**.

9. **K. alba** Nees in Linnæa x. p. 140 (1835); Ridl., *l.c.*; C. B. Clarke, *l.c.*, p. 526.

Huilla.—Heads greenish white. Among short herbage in the drier pastures of Empalanca; end of March 1860. No. **6805**. Rhizome strongly aromatic; heads whitish. In the high pastures, flooded during the rains, of Morro de Monino; April 1860. No. **6806**. In the drier thicket-grown pastures of Catumba; April 1860. No. **6812**.

10. **K. squamulata** in Vahl Enum. ii. p. 381 (1806); Ridl., *l.c.*; C. B. Clarke, *l.c.*, p. 532.

Sierra Leone.—In grassy places between Freetown and Sugar Loaf Mountain; Sept. 1853. No. **6987**.

11. **K. pauciflora** Ridl., *l.c.*, et t. xxiii. figs. 1-4; C. B. Clarke, *l.c.*, p. 530.

Huilla.—Spikelets few, two-flowered, one flower ♀ the other ♂. Style elongated with tripartite apex. Ovary oblong-ovate, subcompressed. Habit almost that of some species of *Uncinia* or *Carex*. Near streams in marshy places between Ferrão da Sola and Catumba; March and April 1860. No. **6811**.

12. **K. albiceps** C. B. Clarke ined.

*K. macrocephala* A. Rich. var. *angustior* C. B. Clarke, *l.c.*, p. 529.

*K. sphærocepha*, C. B. Clarke, *l.c.*, p. 532 (non Boeck).

*Cyperus albiceps* Ridl. in Journ. Bot. 1884, p. 16.

Pungo Andongo.—Præsidium; March 1857. No. **6796** (in part).

2. **PYCREUS** Beauv. Fl. Owar ii. p. 48, t. 86 (1810-18).

*Cyperus* L.; Benth. & Hook. f. Gen. Pl. iii. p. 1043; pro parte.

1. **P. flavescens** Beauv. ex Rchb. Fl. Germ. Excurs. p. 72 (1830); C. B. Clarke in Durand & Schinz, Consp. Fl. Afr. v. p. 537.

*Cyperus flavescens* L. Sp. Pl. p. 46 (1753); Ridl. in Trans. Linn. Soc. ser. 2. ii. p. 125 (1884).

Var. **abyssinicus** C. B. Clarke in Journ. Linn. Soc. xx. p. 279 (1883); Ridl., *l.c.*

*C. politus* Welw. ex Ridl., *l.c.*

Sierra Leone.—In wet places by streams near Freetown; Sept. 1853. No. **7055**.

Ambaca.—Somewhat rare in marshes by Lake Canguéle-Canganga not far from the river Caringa; June 1855. No. **7087**. Somewhat plentiful in partly dried-up marshes and in spongy places between the river Caringa and Lake Canguéle-Canganga; June 1855. No. **7096**.

Golungo Alto.—Plentiful, but seen only in a single locality, in spongy boggy places near Sange by the banks of the river Cuango; Dec. 1854. Nos. **7072**; **7101**. In damp palm-groves with very rich black soil near Ponte de Luiz Simões; July 1855. No. **7088**.

Pungo Andongo.—Umbilla Cuanza, Muta Lucala and near the præsidium; March 1857. No. **6907**. An annual crowded cæspitose plant. On the spongy banks of the river Calunda, in the præsidium; Jan. 1857. No. **6911**. Plentiful by woody marshes near the banks of the river Cuanza near Sansamanda; Feb. 1857. No. **6922**. Marshes near Quitage; March 1857. No. **6923**. An annual, 2 to 2½ ft. high, bright green, with lax decumbent culms and leaves. In marshes on the banks of the stream Casalalé in the præsidium; middle of Jan. 1857. No. **6925**. No. **7150** (no locality).

2. **P. fluminalis**.

*P. propinquus* C. B. Clarke, *l.c.*, p. 541 (non Nees).

*Cyperus fluminalis* Ridl., *l.c.*, p. 127.

Pungo Andongo.—Rather rare by the banks of the river Cuanza near Candumba, growing right in the water along with reeds, *Pandanus Welwitschii* and ferns; 29 Jan. 1857. No. **6897**.

3. **P. Mundtii** Nees in Linnæa ix. p. 283 (1834); C. B. Clarke in Durand & Schinz, *l.c.*, p. 539.

*Cyperus Mundtii* Kunth Enum. ii. p. 17 (1837); Ridl. *l.c.*

Loanda.—No. **7092** (in part).

Golungo Alto.—Culms flagelliform, widely creeping and sterile, then ascending and leafy, leaves stiff. Flowering culms erect, obtusely trigonous, very smooth, peduncles of spikes compressed cylindrical, almost two-edged. Habit of *Remirea maritima*; the flagelliform stolons closely resembling those of species of *Dianthus*. Rather rare in spongy wet places by the river Cuango, closely interwoven with other species

of *Cyperus;* 1 Jan. 1855. No. **7092**. Cæspitose, stems ascending flagelliform, climbing among the higher herbs. Marshy places on the banks of the river Casaballa, Sobato de Bumba, growing with *Mamboga stipulosa* (Welw. herb. No. **3027**); May 1856. No. **7092***b*.

Pungo Andongo.—Beside streams near Cabondo in the præsidium; end of March 1857. No. **6926**.

Mossamedes.—Spongy places at the lake of Giraûl; July 1859. No. **6885**.

4. **P. lanceolatus** C. B. Clarke, *l.c.*, p. 538.

*Cyperus lanceolatus* Poir. in Lam. Encycl. vii. p. 245 (1806).

Huilla.—Damp fields near Lopollo, but not plentiful; March 1860. No. **6873**.

5. **P. umbrosus** Nees in Linnæa x. p. 130 (1835); C. B. Clarke, *l.c.*, p. 543.

*Cyperus fulvus* Ridl., *l.c.*, p. 126.

Huilla.—Plentiful at the edges of woods in damp places between Lopollo and Eme; end of April 1860. No. **6872**. Damp fields formerly grown with thicket near the river in the Lopollo district; end of Feb. 1860. No. **6881**.

6. **P. macranthus** C. B. Clarke, *l.c.*, p. 538.

*Cyperus macranthus* Boeck. in Linnæa xxxv. p. 462 (1867-68); Ridl., *l.c.*, p. 126.

Huilla.—Marshy places at Empalanca, but rare; April 1860. No. **6877**.

Var. **angustifolius** C. B. Clarke ms. in herb. Welw.

*Cyperus lanceus* Thunb. var. *angustifolius* Ridl., *l.c.*

Pungo Andongo.—Candumba; March 1857. No. **6930**.

7. **P. pauper** C. B. Clarke, *l.c.*, p. 540.

*Cyperus pauper* Hochst. ex A. Rich. Tent. Fl. Abyss. ii. p. 478 (1851); Ridl., *l.c.*, p. 126.

Ambaca.—At the edges of flooded fields between the river Caringa and lake Canguéle-Cangauga; June 1855. No. **7069**.

8. **P. albo-marginatus** Nees in Mart. Fl. Bras. ii. pt. 1, p. 9 (1842); C. B. Clarke, *l.c.*, p. 534.

*Cyperus Hochstetteri* Nees ex Krauss in Flora xxviii. p. 755 (1845); Ridl., *l.c.*, p. 126, pro parte.

*C. esculentus* Ridl., *l.c.*, p. 138, pro parte (non L.)

Loanda.—In damp localities flooded in winter, and grown with tall grasses (Capim alto), on dark rich soil near Teba and before Quicuxe, but in few places; May 1854. No. **7046**. In flooded partly dried up places near Quicuxe, in one locality only, but very plentiful there; May 1854. Coll. Carp. 1072.

Pungo Andongo.—Lagoa de Quibinda, Sansamanda; Feb. 1857. Quitaje ad Cuije; March 1857. No. **6907** (in part). On very small islands at the great cataract of the river Cuanza, near Condo; March 1857. No. **6938**.

9. **P. capillifolius** C. B. Clarke, *l.c.*, p. 535.

*C. Afzelii* Boeck. in Linnæa xxxv. p. 475 (1867-68); Ridl., *l.c.*, p. 127.

Pungo Andongo.—No. **6907** (in part) (no notes). Dec. 1856. In

the damp meadows of Catete with *Polygala africana*; Jan. 1857. By wooded marshes near Quilanga and in the præsidium; Feb. 1857. No. **6919**.

10. **P. melas** C. B. Clarke, *l.c.*, p. 538.

*Cyperus melas* Ridl., *l.c.*, p. 127.

Pungo Andongo.—Marshy places near Lombe, with another robust deep-reddish *Cyperus*; March 1857. No. **6913**. Mutollo, Serra de Guinga with dwarf Irideæ (*Ferraria andongensis*) and *Xyris fugaciflora*; Jan. 1857. Nos. **6914**, **7154**.

Huilla.—Lofty pastures of Morro de Lopollo on the way to Empalanca, in places which are flooded in the rainy season; April 1860. No. **6871**.

11. **P. polystachyus** Beauv. Fl. Owar. ii. p. 48, t. 86, fig. 2 (1810-18); C. B. Clarke, *l.c.*, p. 540.

*Cyperus polystachyus* Rottb. Descr. & Ic. p. 39, t. 11, fig. 1; Ridl., *l.c.*, p. 127.

Prince's Island.—In wet places in the higher part of Pico de Papagaio; Sept. 1853. No. **7032**.

Ambriz.—Heads yellowish. In marshy wooded places south of the town; Nov. 1853. No. **7041**.

Loanda.—By pools and ponds on the island of Cazanga (called also Casanga or Cacanga), south of Loanda; in a few places with *Typha*, etc.; 30 April, 1854. No. **7081**.

Golungo Alto.—Plentiful in damp spongy places on the banks of the stream Quiapose, near Sange; Jan. 1855. No. **7100**.

Pungo Andongo.—Growing in marshy meadows with species of *Ascolepis*. No. **6927**.

Mossamedes.—Marshes near Aguadas not far from Mossamedes; July 1859. No. **6890**. Damp places on the banks of the river Caroca (vulg. Croque), near Cabo Negro; Sept. 1859. No. **6891**.

12. **P. nitens** Nees in Nov. Act. Acad. Nat. Cur. XIX. Suppl. 1. p. 53 (1843); C. B. Clarke, *l.c.*, p. 539.

*Cyperus pumilus* L. Cent. ii. Plant. p. 6 (1756); Ridl., *l.c.*, p. 129.

Loanda.—Low growing, obscure, almost cinerascent, cæspitose; spikelets finely pectinate as in some species of *Sphacelaria*, e.g. *S. filicina*. Rather rare at the dry bottoms of ponds and on their edges; near Conceiçao at Represa de Maghalaes. Past flowering 12 July, 1854. No. **7076**.

Pungo Andongo.—Meadows at Catete Jan. 1857. Umbilla, Cuanza; March 1857. No. **6907** (in part). By wooded marshes in sunny places between the præsidium and Quilanga; Dec. 1856 and Feb. 1857. No. **6921**.

Mossamedes.—In damp sands on the banks of the river Bero; beginning of Aug. 1859. No. **6888**.

Huilla.—Too plentiful in fields near Lopollo after a crop of *Sorghum*; May 1860. No. **6854**. Plentiful in rather damp sandy fields with a clayey subsoil, growing with dwarf *Eriocaulaceæ*; May 1860. No. **6879***b*.

13. **P. cuanzensis** C. B. Clarke, *l.c.*, p. 536.

*Cyperus cuanzensis* Ridl., *l.c.*, p. 128.

Pungo Andongo.—Marshy meadows on the river Cuanza near N-billa; March 1857. No. **6899**.

14. **P. pelophilus** C. B. Clarke, *l.c.*, p. 540.
*Cyperus pelophilus* Ridl., *l.c.*, p. 129.

Loanda.—In sandy places which have been flooded and are now drying up near Bemposta; July 1858. By dried-up ponds on the road to Calumba near Cumano; beginning of July 1860. No. **7025**. Remarkable for its falcately curved spikelets. Fairly plentiful on the clay soil of dried-up ponds near Forte de Conceiçao; 12 July, 1854. No. **7082**.

Mossamedes.—Here and there in sandy-clayey marshes near Giraûl; July 1859. No. **6887**.

15. **P. æthiops** C. B. Clarke, *l.c.*, p. 534.
*Cyperus æthiops* Welw. ex Ridl., *l.c.*, p. 129.

Huilla.—Plentiful enough in a single locality in wet pastures between Ferrão da Sola; Jan. and April 1860. No. **6875**.

3. **JUNCELLUS** C. B. Clarke in Durand & Schinz, Consp. Fl. Afr. v. p. 543.
*Cyperus* L.; Benth. & Hook. f. Gen. Pl. iii. p. 1043 (pro parte).

1. **J. lævigatus** C. B. Clarke, *l.c.*, p. 545.
*Cyperus lævigatus* L. Mant. p. 179 (1771); Ridl. in Trans. Linn. Soc. ser. 2. ii. p. 128 (1884).

Island of St. Vincent, Cape Verde Is.—Monte Verde at about 1000 ft. by partly dried-up streams; end of Aug. 1853. No. **7075**.

Mossamedes.—Sandy places on the banks of the river Caraco, Cabo Negro; Sept. 1859. No. **6855**. Near Cavalheiros, in sandy places on the river Bero; July 1859. No. **6856**. In rather saline places near Os Cazados (arimo do Eugenio); Aug. 1859. No. **6857**. Marshy ground near Aguadas, not far from Mossamedes; beginning of July 1859. No. **6858**.

2. **J. pustulatus** C. B. Clarke, *l.c.*, p. 546.
*Cyperus pustulatus* Vahl Enum. ii. p. 341 (1806); Ridl., *l.c.*, p. 128.

Pungo Andongo.—In rather shallow marshes between the præsidium and Quilanga; Feb. 1857. On the banks of the Casalalè; Jan. 1857. No. **6918**. No. **7156** (no information).

4. **CYPERUS** L.; Benth. & Hook. f. Gen. Pl. iii. p. 1043 (pro parte).

1. **C. amabilis** Vahl Enum. ii. p. 318 (1806); Ridl. in Trans. Linn. Soc. ser. 2. ii. p. 130; C. B. Clarke in Durand & Schinz, Consp. Fl. Afr. v. p. 547.

Barra do Bengo.—Gravelly places flooded in the rainy season near Quifandongo, and not far from Cacuaco; May 1854. No. **7084**.

Loanda.—An annual; culms cæspitose erect, spikelets a reddish chestnut colour, of very variable length. Sandy places, which are flooded in summer, near Represa de Luiz Gomes; Feb. 1858. No. **7024**. Low sand-hills near Imbondeiro dos Lobos; beginning of April 1854. No. **7083**. An annual a span high with a several-rayed umbel, and tawny-gold spikelets arranged starwise. Abandoned fields near Quicuxe; April 1854. Coll. Carp. 1070. A very elegant dwarf species with

stellate spikelets. Among fields of Mandioc near Quicuxe; 13 May, 1854. Coll. Carp. 1069.

Pungo Andongo.—Plentiful in sandy woods between Caghui and Mopopo, near the river Cuanza; Feb. 1857. Candumba Lombe; March 1857. No. **6912**.

Huilla.—Plentiful in thicket-grown pastures flooded in the rainy season between Lopollo and Monino; March and April 1860. No. **6893**.

Benguella.—Perhaps the most plentiful of the equatorial African species. In sandy woods between Serra das Bimbas and the town of Benguella; Jan. 1859. No. **6892**.

2. **C. uncinatus** Poir. Encycl. vii. p. 247 (1806); C. B. Clarke, *l.c.*, p. 580.

*C. cuspidatus* H. B. K. Nov. Gen. and Sp. i. p. 204 (1815); Ridl., *l.c.*, p. 130.

Golungo Alto.—In sunny sandy sparsely-grassed places near Cambondo; 24 Dec., 1854. No. **7099**.

Pungo Andongo.—Catete, growing with *Polygala africana*; Dec. 1856. In damp places near Pedra Cabonda; Dec. 1856 and Jan. 1857. In damp pastures on the stream Cazangue at Pedra Sangue; beginning of Jan. 1857. By sunny wooded marshes between the præsidium and Quilanga; tolerably plentiful; Feb. 1857. No. **6910**. Near Salgado's Arimo; Dec. 1856. No. **7155**. Nos. **7157** (in part), **7175**, and **7168** (no information).

Huilla.—Plentiful in damp places in fields after a crop of *Sorghum*, growing with *Pœpalanthus Welwitschii*; May 1860. No. **6879**.

3. **C. aristatus** Rottb. Descr. and Ic. Plant. p. 23, t. vi. fig. 1; Ridl., *l.c.*, p. 130; C. B. Clarke, *l.c.*, p. 548.

Loanda.—Dried up ponds between Bemposta and Cumana on the way to Calumba; July 1858. No. **7029**. Plentiful round the lake of Quicuje; August 1860. No. **7031**. A somewhat plentiful annual growing vigorously in very hard clay by dried-up ponds, near Forte de Conceiçao; 12 July, 1854. No. **7078**.

Pungo Andongo.—In marshy places between Candumba and Lombe; March 1857. No. **6909**. On low rocky hills grown with a short thicket of *Actinopteris radiata* Link (Welw. herb. No. **78**), always somewhat strict in habit; Jan. 1857. Muta Lucala, Condo; March 1857. No. **6909***b*.

Huilla.—Plentiful in fields after a crop of *Zea Mays*. Lopollo, garden of Sr. Kneissmann: May 1860. No. **6895**. Fields near Lopollo; May 1860. Coll. Carp. 1081.

Benguella.—In damp sandy-clayey places between the river Cavado and the river Catumbella. Almost past flowering; June 1859. No. **6894**.

4. **C. cancellatus** Ridl., *l.c.*, p. 131; C. B. Clarke, *l.c.*, p. 551.

Pungo Andongo.—On spongy ground between Muta Lucala and Lombe; March 1857. On banks of streams near Cabonda in the præsidium; end of March 1857. No. **6916**. Plentiful in rice-fields on the small river Miége (Miesche) near Caghuy; end of Feb. 1857. In low-lying wet pastures in the præsidium; March 1857. No. **6917**.

Var. **gracillimus** Ridl., *l.c.* On spongy ground with short herbage in the mixed woods of Monino, but only here and there; beginning of May 1860. No. **6862**.

5. **C. tenax** Boeck. in *Linnæa* xxxv. p. 504 (1867-68); C. B. Clarke, *l.c.*, p. 578.

*C. actinostachys* Welw. ex Ridl., *l.c.*, p. 140.

*C. sabulicolus* Ridl., *l.c.*, p. 136.

Barro do Bengo.—Forming great sods on low gravelly hills near Cacuaco; Dec. 1853. No. **7049**.

Ambriz.—Low gravelly maritime hills near the town; Nov. 1853. No. **7038**.

Pungo Andongo.—Marshes in the præsidium; March 1857. No. **6794**. In hot sand on the banks of the river Cuanza near Candumba; 30 Jan. 1857. No. **6928**. Sandy woods flooded in summer on the right of the river Cuanza; Dec. 1856. No. **6931**.

Huilla.—Dry low hills between Lopollo and Eme; end of April 1860. No. **6866**. Open mixed woods of Monino; end of March 1860. No. **6874**.

6. **C. andongensis** Ridl., *l.c.*, p. 140.

*C. tenax* Boeck. pro parte ex C. B. Clarke, *l.c.*

Pungo Andongo.—In hot sand on the banks of the river Cuanza, near Sansamanda; 7 Feb. 1857. No. **6929**.

7. **C. compressus** L. Sp. Pl. p. 68 (1753); Ridl., *l.c.*, p. 132; C. B. Clarke, *l.c.*, p. 553.

Sierra Leone.—Wooded swamps at the foot of Sugar Loaf Mountain; Sept. 1853. No. **7057**.

Loanda.—In damp poor herbage, Museque de Quicuxe; March 1854. Growing rather sparsely, Cabo Lombo; April 1854. No. **7021**. Sandy sea-shores of the island of Cazanga; April 1858. No. **7024***b* (in part). Half dried ponds, near the road to Calumba near Cumano; growing in the mud; end of July 1860. No. **7026**. On the edge of marshes near Museque de Luiz Gomes, and near Cabo Lombo; April 1854. No. **7045**.

Mossamedes.—In rather damp places at the Horta da Naçao (public garden) near Mossamedes; August 1859. No. **6884**.

8. **C. dichromenæformis** Kunth Enum. ii. p. 26 (1837).

Var. **major** Boeck. in Flora lxii. p. 549 (1875); Ridl., *l.c.*, p. 132; C. B. Clarke, *l.c.*, p. 556.

Golungo Alto.—A perennial aromatic herb, a span to a foot high; leaves accurately spreading, culm acutely triangular with concave sides, spikelets snow-white, flowers triandrous. Rather rare on the edge of marshes and in shady spongy places on the more lofty heights of Queta. In fl. and fr. middle of Dec. 1855. Smell of the dry rootstock almost that of *Anthoxanthum*. In damp places Monte de Queta (Jipepe) end of Dec. 1855. On mountain slopes not far from the river Luinha, on the mountains of Alto Queta. Native name Nsambe; Jan. 1855. No. **7093**.

Pungo Andongo.—Plentiful in rather damp wooded places on the banks of the river Cuanza between Candumba and Lombe, and also in the river Cuije; March 1857. No. **6901**. Rootstock tuberous, culms triquetrous, leaves deep green and somewhat lax, with a fragrant smell of *Anthoxanthum* when dried. Flower-heads snow-white. By springs on the more lofty rocks of the præsidium, in very shady places, and even in caverns; end of Nov. 1856. No. **6902**. No. **7149** (no information).

9. **C. compactus** Lam. Ill. i. p. 144 (1791); C. B. Clarke, *l.c.*, p. 552.

*C. argenteus* Ridl., *l.c.*, p. 133.

*C. margaritaceus* Vahl var. *minor* Ridl., *l.c.*

*C. obtusiflorus* Vahl Enum ii. p. 308 (1806); Ridl., *l.c.*, p. 132.

Pungo Andongo.—Low thicket-grown hills between Candumba and Muta Lucala; March 1857. No. **6900**.

Huilla.—Spikelets snow-white, in a dense head. Low thicket-grown hills near the small river of Catumba; end of March 1860. No. **6905**. Near Nene. In the thicket-grown pastures so often damaged by fires; Feb. and April 1860. No. **6906**.

Var. **flavissimus** C. B. Clarke, *l.c.*

*C. obtusiflorus* Vahl var. *flavissimus* Boeck. in Linnæa xxxv. p. 529 (1867-68); Ridl., *l.c.*

Huilla.—Rather rare in the drier short thicket-grown pastures near Lopollo; beginning of April and May 1860. No. **6876**.

Var. **tenerior** C. B. Clarke, *l.c.*

Huilla.—In the short thicket-grown pastures of Empalanca; end of Feb. 1860. No. **6803**.

10. **C. ochrocephalus** C. B. Clarke, *l.c.*, p. 571.

*C. obtusiflorus* Vahl pro parte; et Var. *Stylo bifido* Ridl., *l.c.*, p. 132.

Golungo Alto.—A rigid herb with horizontal moniliform tuberculose rhizome, culms trigonous, leaves semicylindrical rigid pungent. Heads whitish verging into green. The first plant which appears after the fires, following closely upon them and springing with strong growth from the ashes of the burned plains. Thicket-grown pastures (Queimadas) Sobato de Bumba, but not plentiful, Oct.; very plentiful, Dec. 1855. No. **6813**. Same locality; Oct. 1855. Coll. Carp. 1078. Very rare on the spongy marshy margins of the river Quiapoze; Dec. 1855. No. **7014**.

Huilla.—On low rather dry hills at Lake Ivantâla, but flowering very sparsely; end of Feb. 1860. No. **6838**.

11. **C. margaritaceus** Vahl Enum. Pl. ii. p. 307 (1806); Ridl., *l.c.*, p. 133; C. B. Clarke, *l.c.*, p. 568.

Pungo Andongo.—Condo Quisonde; March 1857. No. **6903**.

Huilla.—Pastures bearing short herbage by the edges of woods near Humpata, but only found here and there; end of April 1860. No. **6904**.

12. **C. nudicaulis** Poir. Encycl. vii. p. 240 (1806); Ridl., *l.c.*, p. 133; C. B. Clarke, *l.c.*, p. 570.

*Anosporum nudicaule* Boeck. in Linnæa xxxvi. p. 411 (1869-70).

Dande.—1 to 2½ ft., densely cæspitose, bright-green, culms erect slender soon nodding among grasses and other neighbouring plants, spikelets a tawny yellow or dull shining gold in a dense head at the top of the culm, sometimes narrow linear, sometimes ovate-lanceolate strongly compressed. Round the lake in the river Dande near Bombo, three leagues from the river mouth; end of Sept. 1858. No. **7028**.

13. **C. sylvestris** Ridl., *l.c.*, p. 134.

*C. diffusus* C. B. Clarke, *l.c.*, p. 557 (non Vahl).

Pungo Andongo.—A plant with the habit of *Scirpus sylvestris* and its allies, rhizome perennial, moniliform-tuberose, culms acutely triquetrous with striate sides, involucral leaves spreading, at first somewhat erect, spikelets whitish. Rather rare on the shady banks of streams near the huge rocks of Cabondo in the præsidium; middle of Jan. 1857. No. **6898**.

14. **C. fertilis** Boeck. in Engl. Botan. Jahrb. v. p. 90 (1883); C. B. Clarke, *l.c.*, p. 562.

*C. Lanceola* Ridl., *l.c.*, p. 134.

Golungo Alto.—Annual; leaves flaccid resembling those of *Plantago lanceolata*, culms triquetrous with very acute angles; spikelets snow-white, usually three, more rarely two or several. Culms flaccidly decumbent, rooting at the viviparous spikelets. By streams in woods near Canguerasange; somewhat rare; Oct. and Nov. 1854. Rather rare by streams at Catomba Queta and Zengas do Queta; May 1856. No. **7094**.

Pungo Andongo.—Marshes of Mato do Pedro Cabondo, but rather rare; Feb. 1857. No. **6896**.

15. **C. diffusus** Vahl, *l.c.*, p. 321; C. B. Clarke, *l.c.*, p. 557.

*C. elegans* Sw. Obs. Bot. p. 30 (1791); Ridl., *l.c.*, p. 135 (non L.).

Golungo Alto.—On banks of streams in the mountains of Alto Queta, but not plentiful; Dec. 1851. No. **7071**.

Pungo Andongo.—Cæspitose, with tuberous stoloniferous rhizome; culms 3 to 5 ft. high, obtusely trigonous. Rather rare in the shady woods of Mata de Pungo; end of March 1857. No. **6942**. A plant 4 to 5 ft. high or more with obliquely suberect culms and cinnamon-coloured flowers. Calemba Island on the river Cuanza, but noticed in one place only; March 1857. No. **6943**. Marshy meadows between Condo and Quisonde on the right of the river Cuanza; March 1857. No. **6943***b*. An erect herb 2 to 3 ft. high, with perennial tuberous rhizome, the triquetrous culms and striate leaves bright green. Flowering spikes a dull green. Marshy places on the river Miége near Calundo; Jan. 1857. No. **6944**.

16. **C. Renschii** Boeck. in Flora lxv. p. 11 (1882); C. B. Clarke, *l.c.*, p. 573.

*C. hylæus* Ridl., *.c.*, p. 134.

Golungo Alto.—A fine plant 5 ft. high, basal sheaths purple, leaves very long, erect, intensely green, culm triquetrous; rhizome moniliform-tuberculose. By streams in shady places, Mata Quisuculo, but not plentiful; 8 Sept. 1855. Damp places near Muangue above N-delle; June 1855. Native name Faca de Deus (Poco iam Zamba). No. **6843**. See Welw. Apont. p. 542, sub No. 31. A gigantic plant, with very sharp cutting edge and keel to the leaves. Rather rare by streams in primitive woods, Quisuculo; June 1857 (Faca de Deus). Coll. Carp. 1077.

17. **C. maritimus** Poir. Encycl. vii. p. 240 (1806); Ridl., *l.c.*, p. 135; C. B. Clarke, *l.c.*, p. 569.

Ambriz.—On low gravelly hills by the ocean near Ponta d'Ambriz; Nov. 1853. No. **7039**.

Loanda.—Perennial, rhizome thick, blood-red within, resinous-viscous, obliquely descending, submoniliform; culms with 1 to 2 bulbs at the base, 1 to 3 ft. high, subcompressed, subglaucous, and furrowed

on the sides. Spikes a dull green, the secondary capitula forming a dense white primary head. Very plentiful throughout the dry sandy coasts of Loanda. Ilha de Loanda; May 1854; in fl. Jan. 1858. No. **7044**. In gravelly soil above Loanda; Alto das Cruzes. Growing with *Commelina*; April 1854. No. **7050**.

Var. **crassipes** C. B. Clarke, *l.c.*

*C. crassipes* Vahl, *l.c.*, p. 299.

St. Vincent's Island, Cape Verde Islands.—Past flowering Sandy sea-shore of Praia da Galè; Jan. 1861. No. **7106**.

18. **C. flabelliformis** Rottb. Descr. and Icon. Pl. p. 42, t. 12, fig. 2; Ridl., *l.c.*, p. 135; C. B. Clarke, *l.c.*, p. 562.

*C. Ginge* Welw. Apont. p. 586. No. 37 (1859).

Golungo Baixo.—One of the plants the stalks of which are used by the negroes for wickerwork. Plentiful by all the streams from the Mongolo mountains to Canguerasange in Golungo Alto, covering all the marshy meadows as if with dwarf palms; Sept. and Oct. 1854. No. **7103**.

Golungo Alto.—*Cyperus Ginge* Welw. Called by the negroes Nginge, Jiginge. A very elegant plant plentiful everywhere by the marshes. Used for making mats; in fr. Aug. 1857. Coll. Carp. 1066. Varzea do Sange; July 1857. Coll. Carp. 1067.

Mossamedes.—Lakes at the mouth of the river Giraûl; 18 July, 1859. No. **6882**.

19. **C. marginatus** Thunb. Prodr. Pl. Cap. p. 18 (1794); Ridl., *l.c.*, p. 136; C. B. Clarke, *l.c.*, p. 568.

Benguella.—A perennial salt-loving herb, differing in its mode of growth from the rest of the genus. In rather damp sandy maritime places to the south of the city, and near the banks of the river Bero; June and July 1859. No. **6859**.

20. **C. Haspan** L. Sp. Pl. p. 45 (1753); Ridl., *l.c.*, p. 136; C. B. Clarke, *l.c.*, p. 564.

Ambriz.—Very rare in marshes near the town of Ambriz, growing cæspitosely with *Flagellaria guineensis* Schum., etc. Ponta d'Ambriz; Nov. 1853. Nos. **7035**, **7035***b*.

Ambaca.—Widely cæspitose in partly dried marshes between the river Caringa and lake Canguèle-Canganga; June 1855. No. **7097**.

Golungo Alto.—Culms trigonous, weak and flaccid, almost scandent. Spongy places at a ferruginous spring near Bango, but seen nowhere else; 27 April, 1856. No. **7086**. A depauperated form? Spongy thickets on the banks of the Cuango; a unique specimen; Jan. 1856. No. **7102***b*.

Pungo Andongo.—In the deeper forest-marshes of the præsidium; Feb. 1857. Also at Lombe. No. **6908**. Damp meadows near Muta Lucala, but somewhat rare, and Candumba on the river Cuanza; Mar. 1857. No. **6932**.

21. **C. flavidus** Retz. Obs. v. p. 13 (1789); Ridl., *l.c.*; C. B. Clarke, *l.c.*, p. 563.

Loanda.—Prostrate, cæspitose, with weak filiform culms, small heads, and very small spikelets. Here and there on the clay of dried-up ponds near Forte de Conceiçao; 12 July, 1854. No. **7077**.

Pungo Andongo.—Ponds near Quisonde; Mar. 1857. No. **6917**. Lagoa de Quibinda. No. **6920**. Damp wooded meadows between

Condo and Quisonde on the right of the river Cuanza ; Mar. 1857. No. **6924**.

22. **C. denudatus** Linn. f. Suppl. Pl. p. 102 (1781) ; C. B. Clarke, *l.c.*, p. 555.

Huilla.—Dried-up ponds near Nene ; May 1860. No. **6861**.

23. **C. sphærospermus** Schrad. Anal. Fl. Cap. p. 8 (1832) ; C. B. Clarke, *l.c.*, p. 577.

*C. huillensis* Ridl., *l.c.*, p. 139, including var. *aphylla*.

Huilla.—Rhizome tuber-bearing. Here and there in fields now neglected but formerly sown with *Solanum tuberosum* ; beginning of May 1860. No. **6865**. Widely cæspitose among herbage in thickets between Nene and Humpata ; May 1860. No. **6867**. Low rather dry hills grown with short thicket near Humpata ; April 1860. No. **6868**. At the foot of Serra de Oiahoia, Sobato Humpata ; end of April 1860. No. **6869**. Plentiful on the stream near Bumbo ; June 1860. No. **6889**.

24. **C. difformis** L. Cent. ii. Plant. p. 6 (1756) ; Ridl., *l.c.*, p. 137 ; C. B. Clarke, *l.c.*, p. 556.

Barra do Dande.—Widely cæspitose, culms weak, 1 to 1½ feet high, spikes tawny yellowish. On the banks of a lake near Bombo near the banks of the river Dande ; Sept. 1858. No. **7027**.

Loanda.—In the clayey bottom of dried-up ponds near Forte de Conceiçao, but very rare ; 12 July, 1854. No. **7065**.

Ambaca.—Cæspitose at the lake Canguèle-Canganga and on the banks of the river Caringa ; June 1855. No. **7066**.

Golungo Alto.—Very widely cæspitose; culms acutely triquetrous, colour of the whole plant yellowish green. Very rare on spongy islands of the river near Banza de Bango ; 30 April and 1 May 1856. No. **7067**.

Pungo Andongo.—In wooded ponds between Condo and Calemba Islands ; March 1857. No. **6933**. Marshy places at Luxillo ; April 1857. No. **6934**.

Mossamedes.—In damp sandy places near the river Bero at Cavalheiros ; July 1859. No. **6853**. In grassy places flooded in summer on the banks of the river Bero near Cavalheiros, but found only here and there ; August 1859. No. **6883**.

25. **C. dichroostachyus** Hochst. ex A. Rich. Tent. Fl. Abyss. ii. p. 481 (1851) ; Ridl., *l.c.* ; C. B. Clarke, *l.c.*

Huilla.—By wooded ponds near the banks of the river Mupanda ; end of Feb. 1860. No. **6864**.

26. **C. leucocephalus** Retz. *l.c.* p. 11 ; Ridl., *l.c.* ; C. B. Clarke, *l.c.*, p. 566.

*C. seslerioides* Ridl., *l.c.*, p. 130 (non H.B.K.).

Pungo Andongo.—Rain swamps in rocky places between the præsidium and Quilanga ; Feb. 1857. No. **6772**. No. **7146** (no information). Heads snow-white. Forms a striking ornament of the short-grassed wooded pastures in springtime (December). Plentiful in thickets and wooded pastures of the præsidium, especially near Quilanga and Catete ; Dec. 1856. No. **7147**.

Huilla.—A rigidulous herb 4 to 6 in. high ; heads snow-white, almost spherical, compact. Habit exactly that of *Ascolepis*, but the

arrangement of the spikelets is quite different, as are also the leaf-sheaths on the culm. Here and there in marshy meadows by the banks of the river Cocolovar. A few specimens in flower Feb. 1860. No. **1675**. Heads white. In lofty spongy mountainous places at Humpata growing with Ericaceæ; Serra de Oiahoia; April 1860. No. **6783**.

27. **C. eleusinoides** Kunth Enum. ii. p. 39 (1837); Ridl., *l.c.*, p. 137.

*C. nutans* C. B. Clarke, *l.c.*, p. 570 (non Vahl).

Pungo Andongo.—Six to eight feet high, culms obtusely trigonous, branches of the panicle or umbel 1 to 2 ft. Native name, N-tóle, Iintóle. Gregarious, but not in many places, on the banks of the stream near Quilanga. Used by the negroes for making mats. Feb. 1857. No. **6941**.

28. **C. nutans** Vahl, *l.c.*, p. 363; C. B. Clarke, *l.c.*, p. 570.

*C. distans* Ridl., *l.c.*, p. 138 (non Linn. f.).

Pungo Andongo.—Damp meadows on the banks of the river Lombe, in the district of Condo; March 1857. No. **6935**.

29. **C. distans** Linn. f. Suppl. Pl. p. 103 (1781); Ridl., *l.c.*, p. 138 pro parte; C. B. Clarke, *l.c.*, p. 558.

Prince's Island.—Sandy places on the sea-shore near Port de S. Antonio; Sept. 1853. No. **7033***b*.

Loanda.—Marshes at the Represas pequenas (small ponds or reservoirs) of Sr. Ricardo; end of April 1854. No. **7047**. Represa de Luiz Gomes to the rear of Alto das Cruzes; Dec. 1853 and Feb. 1854. No. **7048**. Represa de Quicuxe; May 1854. No. **7054**.

Ambaca.—At lake Canguèle-Canganga, but not plentiful; June 1855. No. **7095**.

30. **C. longus** L. Sp. Pl. p. 45 (1753).

Var. **tenuiflorus** Boeck. in Linnæa xxxvi. p. 281 (1869–70); C. B. Clarke, *l.c.*, p. 567.

*C. longus* Dumont D'Urville Enum. Pl. Or. p. 6 (1822); Ridl., *l.c.*, (non L.).

Mossamedes.—Plentiful in damp places on the borders of sugar plantations; July 1859. No. **6886**.

31. **C. rotundus** L., *l.c.*; C. B. Clarke, *l.c.*, p. 574.

Var. **elongatus** Ridl., *l.c.*, (non Boeck.).

Bengo.—Plentiful in marshy places on the river Bengo, near S. Antonio; Dec. 1853. No. **7023**.

Loanda.—At the lake, Quicuxe; April 1854. No. **7053**.

Golungo Alto.—A bulbous-tuberculous plant infesting the fields, and almost impossible to extirpate when it has once got a hold. This species and another besides with yellowish spikelets but without tubers, form twice a year, after each rainy season, green grass-plots. Plentiful round the villages of the negroes and on the waysides. Sange; April 1855. No. **7102** (in part).

32. **C. corymbosus** Rottb. Descr. & Icon. Pl. p. 42, t. vii. fig. 4 (1773); C. B. Clarke, *l.c.*, p. 554.

*C. articulatus* forma haud articulata, Ridl., *l.c.*, p. 141 (non L.).

Pungo Andongo.—Near *C. articulatus*, but jointed culms were

never observed in this species. Root slightly aromatic. Very plentiful in thicket-grown marshes on the banks of the river Lombe, near Lombe ; end of March 1857. No. **6937**.

33. **C. articulatus** L., *l.c.*, p. 44; Ridl., *l.c.*, pro parte; C. B. Clarke, *l.c.*, p. 548.

Congo.—Edges of lakes, Quizembo ; Nov. 1853. No. **7034**.

Icolo e Bengo.—Culms more or less tuberously thickened at the base, woody and very hard. Plentiful at Lagoa da Funda, near Funda ; beginning of Sept. 1857. No. **7051**. Plentiful at the edges of the lake Lagoa da Funda growing with *Limnophyton obtusifolium* (Welw. Herb. No. 3010) ; Sept. 1854. No. **7089**.

Pungo Andongo.—Root-tubers pleasantly aromatic fragrant, often used by the negroes for colic. Growing gregariously on the marshy banks of the river Cuanza, near Sansamanda and Mopopo with *Phœnix spinosa* ; 6 Feb. 1857. No. **6936**.

34. **C. Zollingeri** Steud. in Zoll. Syst. Verz. Ind. Arch. p. 62 (1854) : C. B. Clarke, *l.c.*, p. 581.

*C. Hochstetteri* Ridl., *l.c.*, p. 126, pro parte (errore, non Nees). *C. lucidulus* C. B. Clarke in Journ. Linn. Soc. xxi. p. 99 (1884) pro parte ; Ridl., *l.c.*, p. 139, pro parte (non Klein).

*C. sphacelatus* Ridl., *l.c.*, pro parte (non Rottb.).

Sierra Leone.—Gathered together with other white-headed Cyperaceæ during a heavy rain, in pleasantly green meadows, between Freetown and the neighbouring mountains, close up to the city ; Sept. 1853. No. **7058**.

Pungo Andongo.—Three, more rarely 4 ft. high, with a bulbous tuberous aromatic root smelling like *Acorus Calamus*, culms erect or oblique, umbel with few rays, spikes nodding or even pendulous. Plentiful in thickets between the river Cuanza and Caghuy ; 15 Jan. 1857. No. **6940** (in part).

35. **C. Schweinfurthianus** Boeck. in Flora, lxii. p. 553 (1879) ; C. B. Clarke in Durand & Schinz, *l.c.*, p. 576.

*C. Hochstetteri* Ridl., *l.c.*, p. 126, pro parte (errore, non Nees). *C. lucidulus* C. B. Clarke in Journ. Linn. Soc., *l.c.*, pro parte ; Ridl., *l.c.*, p. 139, pro parte (non Klein).

Pungo Andongo.—Quitage on the Cuije ; Mar. 1857. No. **6940** (in part).

Very near to the last species.

36. **C. sphacelatus** Rottb. Descr. & Icon. Pl. p. 26 ; Ridl., *l.c.*, p. 139, pro parte ; C. B. Clarke in Durand & Schinz, *l.c.*, p. 577.

*C. pustulatus* Ridl., *l.c.*, p. 138 (non Vahl).

Sierra Leone.—Near a stream in the city of Freetown, not far from the ocean, almost damped by the sea-water ; Sept. 1853. No. **7056**.

Loanda.—No. **7102** (in part).

Golungo Alto.—Widely and densely cæspitose, annual. On sandy flooded ground at the foot of Mt. Cungulungulo, but rare ; end of Jan. 1855. No. **7070**. Grassy places near Sr. Rodrigo's house, but rare ; Feb. 1855. No. **7090**.

37. **C. esculentus** L., *l.c.*, p. 45 ; Ridl., *l.c.* ; C. B. Clarke, *l.c.*, p. 559.

Golungo Alto.—Gravelly places at the foot of Mt. Cungulungulo,

but here and there only; end of Jan. 1855. No. **7098**. Meadows and pastures round Sange springing up after the rains; Nov. 1853. Very plentiful in the herb-grown pastures throughout Sobato Bumba after the rains; Oct. to Dec. 1855. No. **7102** (in part).

Pungo Andongo.—Near the præsidium; Feb. 1857. No. **6907** (in part).

38. **C. bulbosus** Vahl Enum. ii. p. 342 (1806); Ridl., *l.c.*, p. 140; C. B. Clarke, *l.c.*, p. 550.

Loanda.—Sandy shores of the Atlantic near the mouth of the river Cuanza; May 1854. No. **7073**. Culm triangular, with one angle acute, two obtuse, leaves channelled and, like the culm, striate and shining. Near the sea at Zamba Grande and Cabo Lombo; April 1854. No. **7074**. Rather damp sandy places at Zamba Grande; May 1854. Coll. Carp. 1071.

Mossamedes.—A bulbiferous plant. Plentiful and widely cæspitose in once cultivated places near Cavalheiros; August 1859. No. **6852**.

39. **C. apricus** Ridl., *l.c.*, p. 141; C. B. Clarke, *l.c.*, p. 548.

Pungo Andongo.—Sunny places on the rocks of the præsidium growing with *Actinopteris flabellata*; Dec. 1856. Between Muta Lucala and Quibonda; March 1857. No. **6915**. Nos. **7163**, **7164** (no information).

40. **C. atractocarpus** Ridl., *l.c.*; C. B. Clarke, *l.c.*, p. 549.

Huilla.—Plentiful in the loftier pastures of Empalanca; Feb. and April 1860. No. **6863**.

41. **C. Papyrus** L., *l.c.*, p. 47; Ridl., *l.c.*; C. B. Clarke, *l.c.*, p. 571.

Loanda.—Here and there at the ponds (Represa) of Maghellaõ near Boa Vista. Not yet in flower; 10 August 1854. No. **7085**.

Golungo Alto.—The prince of Cyperaceæ, the largest and most beautiful of the whole family, and of great economic use. It supplies the natives with paper, roofing, beds, etc. On the banks of the river Delamboa, growing with *Caladium*, and a species of *Costus* (probably *C. afer*), at Borda Grande, etc. Small specimens. May 1855. No. **7104**.

42. **C. socialis** C. B. Clarke, *l.c.*, p. 577.

*C. latifolius* Ridl., *l.c.*, p. 138 (non Poir.).

Cazengo.—At the lake of Moembege, growing with *C. Papyrus*, and ferns, but not plentiful; June 1855. No. **7068**.

43. **C. auricomus** Sieb. ex Spreng. Syst. i. p. 230 (1825); Ridl., *l.c.*, p. 142; C. B. Clarke, *l.c.*, p. 549.

Barra do Dande.—Widely cæspitose, 3½ to 5 or even 7 ft. high, culms and leaves shining green, flower-panicles yellowish gold. Very plentiful round the lake on the banks of the river Dande near Bombo; in fl. Sept. 1858. No. **7042**.

Barra do Bengo.—Plentiful in marshy places by the lake of Quifandongo; Dec. 1853. No. **7080**. A beautiful plant, with tawny-gold flowers. Lake Quifandongo; Feb., Dec., and May. Coll. Carp. 1068.

Loanda.—Culm acutely triangular; leaves with a long broad sheath, shorter than the culm, deeply channelled, acutely carinate. Plentiful in marshes and by artificial ponds near Boa Vista, growing more than 3 metres high; August 1854. No. **7043**.

Huilla.—Forest swamps in the Mupanda river; Feb. 1860. No. **6870**.

44. **C. radiatus** Vahl, *l.c.*, p. 369; Ridl., *l.c.*; C. B. Clarke, *l.c.*, p. 573.

Barra do Dande.—A sparsely cæspitose annual, culms erect, 2 ft. high, triquetrous, firm, deep purple towards the apex and on the base of the involucre ; young spikes cylindrical, adult and seed-bearing more or less swollen and distorted, in the young and flowering stage green, when old a dull brown. Nut triquetrous. Habit of *Mariscus*. In wet sandy clayey places round the lake on the right of the river Dande near Bombo ; end of Sept. 1858. No. **7036**.

Icolo e Bengo.—Annual, 1 ft. high, laxly cæspitose, culms ascending, spikes cylindrical, greenish, dilated, distorted and dull brown when in fruit, spikelets bifariously compressed. On the banks of a lake near Folo, but not plentiful ; Sept. 1857. No. **7030**.

45. **C. exaltatus** Retz. Obs. v., p. 11 (1789).

Var. **dives** C. B. Clarke in Journ. Linn. Soc. xxi. p. 187 (1884) ; in Durand & Schinz, *l.c.*, p. 561.

*C. dives* Delil. Fl. d'Egypt. p. 149, t. 4. fig. 3 (1812) ; Ridl., *l.c.*

Golungo Alto.—A fine plant 4 to 7 ft. high, with an obtusely trigonous polished culm. Plentiful by the Cuango and Quiaposa streams near Sange ; Nov. 1854. No. **7091**.

Pungo Andongo.—Between Condo and Quisonde in wooded marshy places ; March 1857. No. **6939**.

46. **C. callistus** Ridl., *l.c.*, p. 143 ; C. B. Clarke, *l.c.*, p. 551.

Loanda.—A noble plant 4 to 5 feet high with beautiful and striking tawny-gold flower panicles ; fibres of root-stock bulbiferous, bulbs with chestnut-coloured tunics, ovate-acute. Grows sparsely among herbage by ponds near Quicuxe ; March 1854. No. **7079**.

Material insufficient for determination.

St. Vincent, Cape Verde Islands.—Growing in very thick tufts, but not yet well-developed. Shore near Porto de Mindello ; August 1853. No. **7022**.

Loanda.—Sandy mud near Cabo Lombe ; Apr. 1858. No. **7024***b* (in part).

Huilla.—Dried up swamps near Nene ; May 1860. No. **6878**. *C. Amnicola* Ridl., *l.c.*, p. 131 (non Kunth).

5. **MARISCUS** Gaertn. Fruct. i. p. 11 (1788).

*Cyperus* L. ; Benth. & Hook. f. Gen. Pl. iii. p. 1043, pro parte.

1. **M. durus** C. B. Clarke in Durand & Schinz, Consp. Fl. Afr v. p. 587.

*Cyperus durus* Kunth Enum. ii. p. 76 (1837).

*C. lætus* Ridl. in Trans. Linn. Soc. Ser. 2, ii. p. 138 (1884) (non Presl.).

Huilla.—Wet wooded places now almost dried up near Eme, on the way to lake Ivantâla ; beginning of May 1860. No. **6860**.

2. **M. rufus** H.B.K. Nov. Gen. & Sp. i. p. 216. t. 67 (1815) ; C. B. Clarke, *l.c.*, p. 592.

*Cyperus ligularis* L. Amoen. Acad. v. p. 391 (1760) ; Ridl., *l.c.*, p. 142.

Prince's Island.—Rather rare in somewhat damp places on the edges of woods in the ascent of Pico de Papagaio ; Sept. 1853. No. **7037**. Apparently a viviparous form found at the same place and even in the same tuft ; Sept. 1853. No. **7037***b*.

3. **M. Dregeanus** Kunth, *l.c.*, p. 120; C. B. Clarke, *l.c.*, p. 586.
*Cyperus dubius* Boeck. in Linnæa xxxvi. p. 336 (1869-70); Ridl., *l.c.*, p. 133, pro parte (non Rottb.)

Loanda.—Heads whitish, fleshy. Grassy herb-grown places in sandy soil near Penedo, but rare; May 1854; No. **6807**.

4. **M. coloratus** Nees in Linnæa ix. p. 286 (1834); C. B. Clarke, *l.c.*, p. 585.
*Cyperus dubius* Boeck. *l.c.*, Ridl., *l.c.*, pro maxima parte (non Rottb.).

Pungo Andongo.—On wooded rocks near Quilanga growing with *Ophioglossum vittatum*; Dec. 1856. No. **6802**. A succulent plant; culms bulbous at the base, leaves shining coriaceous-rigid, heads white, glumes subfleshy. Plentiful on the rocks of the præsidium in places rich in humus, *e.g.* near Cazella at the washerwomen's brook; in fl. Dec. and Feb. 1856-7. No. **7162**. No. **7148** (no information).
Huilla.—Wooded pastures at Monino; end of Jan. 1860. No. **6804**.

5. **M. ferax** C. B. Clarke, *l.c.*, p. 587.
*Cyperus ferax* L. Rich. in Act. Soc. d'Hist. Nat. Paris, i. p. 106 (1792); Ridl., *l.c.*, p. 142 (excluding obs. of Welwitsch).

Prince's Island.—Spikelets yellowish green, more rarely reddish. Culms sometimes 6 feet high. On the damp sandy shore at Porto San Antonio, but rather rare; Sept. 1853. No. **7033**.
Icolo e Bengo.—Cæspitose in wet places together with *Pistia stratiotes* var. *obcordata* (Herb. Welw. No. 214), on the edges of the lake of Quilunda; 5 Sept. 1857. No. **7052**.
Huilla.—Damp fields among *Sorghum* plantations near Monino; Feb. 1860. No. **6880**.

6. **M. eurystachys** C. B. Clarke, *l.c.*
*Cyperus eurystachys* Ridl., *l.c.*

Huilla.—Growing sporadically among herbage in rather damp places in mixed woods along with species of *Gladiolus*; end of April 1860. No. **7061**.

7. **M. tanyphyllus** C. B. Clarke, *l.c.*, p. 594.
*Cyperus tanyphyllus* Ridl., *l.c.*

Golungo Alto.—Rather poor thicket-grown places near Sange; Dec. 1854. Here and there in lofty wooded places near Banza de Quilombo; Jan. 1855. No. **7010**. Growing cæspitosely in primæval woods, Sobato Quilombo-Quiacatubia; Feb. 1855. No. **7171***b*. Primæval woods of Quibanga; Dec. 1855. No. **7006***b*.

8. **M. macrocarpus** Kunth, *l.c.*; C. B. Clarke, *l.c.*, p. 589.
*Cyperus flavus* Ridl., *l.c.*, p. 144 (non Boeck.)

Pungo Andongo.—Candumba; Jan. 1857. Calemba Island, Cuanza; and Condo, Quisonde; Mar. 1857. No. **7009**.

9. **M. Myrmecias** C. B. Clarke, *l.c.*, p. 590.
*Cyperus Myrmecias* Ridl., *l.c.*

Huilla.—Widely cæspitose. Plentiful on sandy ant-hills in wooded meadows between Lopollo and Monino; March and May 1860.

No. **7059**. Among herbage in the clearer mixed woods of Monino. Scarcely cæspitose ; April 1860. No. **7060**.

10. **M. umbellatus** Vahl Enum. ii. p. 376 (1806) ; C. B. Clarke, *l.c.*, p. 595.

*Cyperus umbellatus* C. B. Clarke in Journ. Linn. Soc. xx. p. 296 (1883) ; Ridl., *l.c.* (non Benth.).

Sierra Leone.—Mountain woods above Freetown ; Sept. 1853. No. **7062**.

Prince's Island.—Heads green spiciform almost sessile or unequally stalked. Plentiful in sparsely grassed woods near Porto San Antonio ; Sept. 1853. No. **7063**. An erect perennial, spikes green, stalked, leaves grass-like, rigidulous, shining, tough. Plentiful in rather dry woods in the lower regions. Porto San Antonio; Sept. 1853. No. **7064**.

Golungo Alto.—Primitive forest of Quibanga ; Dec. 1855. No. **7006**.

Pungo Andongo.—A yellowish-green herb, shining, rigidulous. Bracts with palm-like arrangement, heads greenish. Shady places at the Cataract of Calunda on the præsidium ; Nov. 1856. No. **7009**. Nos. **7159**, **7165** (no information).

In palm-groves ; Oct. Nos. **7008**, **7008***b* (without locality).

Material insufficient for determination.

Ambriz.—Gravelly places near Ambriz. Part flowering ; Nov. 1853. No. **7040**.

Tribe II. *SCIRPEÆ*.

6. **ELEOCHARIS** R. Br. ; Benth. & Hook. f. Gen. Pl. iii. p. 1047.

1. **E. chætaria** Roem. & Schult. Syst. Veg. ii. p. 154 (1817) ; Ridl. in Trans. Linn. Soc. ser. 2. ii. p. 148 (*Heleocharis*) ; C. B. Clarke in Durand & Schinz, Consp. Fl. Afr. v. p. 597.

Huilla.—Lofty pastures of Morro do Monino, in sandy places grown with short herbage and flooded in the rainy season ; growing intermingled with other glumaceous plants ; April 1860. No. **6964**.

2. **E. anceps** Ridl., *l.c.* (*Heleocharis*) ; C. B. Clarke, *l.c.*, p. 596.

Pungo Andongo.—A densely cæspitose herb, with erect two-edged flattened culms, and linear many-furrowed glaucescent leaves. Damp sandy places near Condo on the wooded banks of the river Cuanza ; beginning of March 1857. No. **6817**. A small annual laxly cæspitose plant, with spreading culms and leaves. Damp grassy woods between Mopopo and Sansamanda ; in fr. 1 May 1857. No. **7170**.

3. **E. fistulosa** Link Jahrb. Gewächsk. i. Heft 3. p. 78 (1820) ; C. B. Clarke, *l.c.*, p. 598.

*Heleocharis plantaginea* Ridl., *l.c.* ; p. 149 pro parte (non R. Br.).

Ambaca.—Fairly plentiful at lake Canguèle-Canganga, not far from the river Caringa ; June 1855. No. **6842**.

4. **E. palustris** R. Br. Prodr. Fl. N. Holl. p. 224 (1810) ; Ridl., *l.c.* (*Heleocharis*) ; C. B. Clarke, *l.c.*, p. 600.

Huilla.—Style said by Welwitsch to be trifid but this is not borne out by examination of the specimens. Damp sandy places on the river in the Lopollo district growing with many other Scirpoideæ ; in fl. and fr. Apr. 1860. No. **6969**.

5. **E. plantaginea** R. Br., *l.c.* ; Ridl., *l.c.*, pro parte (*Heleocharis*) ; C. B. Clarke, *l.c.*

Cazengo.—Rhizome tuberous, aromatic, highly esteemed by the

natives as a remedy for chest diseases, and everywhere cultivated by them. Cultivated specimens without flower picked at Sensala on the journey to Muxaula; Dec. 1854. No. **7013.**

Huilla.—At wooded ponds by the river Cacolovar near lake Ivantâla, but not yet well developed; end of Feb. 1860. No. **6968.**

7. **FIMBRISTYLIS** Vahl; Benth. & Hook. f. Gen. Pl. iii. p. 1048, pro parte.

1. **F. monostachya** Hassk. Pl. Jav. Rar. p. 61 (1848); Ridl. in Trans. Linn. Soc. ser. 2. ii. p. 149; C. B. Clarke in Durand & Schinz, Consp. Fl. Afr. v. p. 607.

*Abildgaardia monostachya* Vahl Enum. ii. p. 296.

Huilla.—Spikes white. Sandy clayey meadows among short herbage between Monino and Eme, plentiful in a single locality; beginning of April 1860. No. **6839.**

2. **F. squarrosa** Vahl, *l.c.*, p. 289; Ridl., *l.c.*; C. B. Clarke, *l.c.*, p. 609.

Dande.—A densely cæspitose annual, culms erect, the lateral spreading, 4 to 5 in. high, angled, fairly rigid for the size of the plant. The whole plant of a bright green when alive, appearing hoary when dried from the white hairs by which it is covered on all sides. Seen in one place only but plentiful there, on the banks of the larger lake near Bombo; in fl. end of Sept. 1858. No. **6997.**

3. **F. diphylla** Vahl, *l.c.*; C. B. Clarke, *l.c.*, p. 603.

*F. communis* Kunth Enum. ii. p. 234 (1837); Ridl., *l.c.*, p. 150.

Sierra Leone.—Sept. 1853. No. **6991.**

Ambriz.—Damp grassy places south of the town; Nov. 1853. No. **7002.**

Ambaca.—Widely cæspitose, 1 to 1½ ft. high. Rather plentiful in spongy places on the left of the river Caringa; June 1855. No. **7018.**

Golungo Alto.—Damp palm-groves on the river Cuanga; Nov. 1855. No. **7017.** Pastures of Quilombo-Quiacatubia; Jan. 1855. No. **7019.**

Pungo Andongo.—Lake of Quibinda; March 1857. No. **6823***b*. Here and there in wet places near Cazellas, 6 Jan., Sansamanda, Feb., Manghe-Candumba and Umbilla on the Cuanza, March 1857. No. **6827** (in part). Muta Lucala; March 1857. No. **6830***c*. Perennial 2 to 2½ ft. high, culm polished, leaves with long scattered hairs. Here and there on banks of streams near Quilanga; Feb. 1857. No. **6830***d*. Quitage on the Cuije. No. **6832.** Plentiful on marshy banks of the river Cuanza near Sansamanda; 6 Feb. 1857. No. **6834.** Cæspitose with erect more or less hairy culms, and rigidulous glaucescent leaves. Cultivated ground on the stream Miége near Caghuy; end of Feb. 1857. No. **6835***b*. No. **7169** (no information).

4. **F. pilosa** Vahl, *l.c.*, p. 290; C. B. Clarke, *l.c.*, p. 608.

*F. communis* Ridl., *l.c.* (non Kunth).

Pungo Andongo.—Pedras de Guinga; Jan. 1857. No. **6827** (in part).

5. **F. ferruginea** Vahl, *l.c.*, p. 291; Ridl., *l.c.*, p. 149; C. B. Clarke, *l.c.*, p. 606.

Mossamedes.—Dried-up lakes on the banks of the river Caroca, but not plentiful; Sept. 1859. No. **6970.**

Var. **graminea** Ridl., *l.c.*

St. James' Island.—Plentiful; Jan. 1861. No. **7105.**

6. **F. exilis** Roem. & Schult. Syst. Veget. ii. p. 98 (1817); C. B. Clarke, *l.c.*, p. 604.

*F. Hildebrandtii* Ridl., *l.c.*, p. 155, et var. *egregia* Ridl., *l.c.*, p. 156.

*F. hispidula* Kunth, *l.c.*, p. 227.

Ambriz.—Low gravelly hills near the town; very plentiful and polymorphic; Nov. 1853. No. **7001**.

Loanda.—Cæspitose, glaucous, spikelets ovate-acute in umbels of 2 to 5. Plentiful on the gravelly shores of Casanga Island, 3½ leagues south of Loanda, below Barra da Corimba; 30 April 1854. No. **6983**. Gravelly places near Museque de Sr. Luiz Gomes; May 1854. No. **6984**. Sandy places flooded in the rainy season near Imbondeiro dos Lobos, March, gravelly places near Cacuaco, April 1854. No. **6985**. Road to Calumbo, 1½ leagues from Loanda; May 1854. No. **6986**. Sandy places near Penedo; Jan. 1859; Quicuje, on the last excursion; Aug. 1860. No. **6996**. Plentiful on the sandy sea-shore of Praia de Bispo and of Zamba Grande; Feb. 1858. No. **6998**. Sandy pastures usually flooded in the rainy season, near Maianga do Poco; end of Dec. 1857. No. **6998***b*. Sandy short-grassed places near Forte de Penedo but rather rare; Dec. 1857. No. **6998***c*.

(?) Golungo Alto.—No. **7012***b* (no information).

Pungo Andongo.—Sandy thickets between the præsidium and the river Cuanza; Dec. 1856. No. **6822**. With *Polygala africana* in meadows at Catete, Jan., swampy pastures round the præsidium and marshy places near Luxillo, April 1857. No. **6823** (in part). Dec. 1856; No. **6826**. Spongy marshes towards the south of the præsidium; Dec. 1856. No. **6827***b* (in part). Calunda; Jan. 1857. No. **6828** (in part). Sandy marshes between the præsidium and Quilanga; Feb. 1857. No. **6831** (in part). No. **6831***b*. Lombe growing with *Belmontia platyptera* Baker (Herb. No. 1512); Mar. 1857. No. **6833**. Nos. **7152**, **7161** (no information).

Huilla.—Among tufts of Xylideæ in the more lofty pastures of Morro de Lopollo. A unique specimen found in the beginning of May 1860. No. **6946**. Sandy pastures, in places which are flooded in summer, between Catumba and Hay; April 1860. No. **6953**. Low sandy hills grown with short thicket between Nene and Ferrão da Sola; beginning of Dec. 1859. No. **6954**. Growing sporadically in tufts in the wooded pastures of Monino; April 1860. No. **6956**. Abandoned fields round Sonsala do Monino, Feb., and at the end of April almost everywhere round Lopollo, 1860. No. **6957**.

6. **F. complanata** Link Hort. Berol. i. p. 292 (1827); Ridl., *l.c.*, p. 150; C. B. Clarke, *l.c.*, p. 602.

Pungo Andongo.—Banks of streams near Luxillo; Feb. 1857. No. **6835**.

Huilla.—Rather poor thicket-grown pastures which are flooded in summer, near Eme; end of March 1860. No. **6971**.

7. **F. obtusifolia** Kunth, *l.c.*, p. 240; C. B. Clarke, *l.c.*, p. 608.

*F. rigidula* Ridl., *l.c.* (non Kunth).

Loanda.—Widely and densely cæspitose, fixed by its very tough, long, and almost unbranched root-fibres in the beds of *Halimum Portulacastrum* on the seashore. Culms erect, 1 to 2 feet, flattened and two-edged, generally twice or thrice twisted, leafy at the base; leaves linear, coriaceous, shining, roundly channelled, forming tufts resembling *Armeria maritima*. Spikelets many-flowered, dull chestnut-coloured. Caryopsis dull chestnut, hard and crustaceous, obovate, obtusely trigonous with truncate apex, and finely transversely rugulose

surface. Seen only in one place on the sandy seashore of Baia da Zamba Grande to the south-west of Loanda; in fl. and fr. 16 Jan. 1859. No. **6993**.

8. **BULBOSTYLIS** Kunth Enum. ii. p. 205 (1837).

*Fimbristylis* Vahl; Benth. & Hook. f. Gen. Pl. iii. p. 1048, pro parte.

1. **B. macra** C. B. Clarke in Durand & Schinz, Consp. Fl. Afr. v. p. 614.

*Fimbristylis macra* Ridl. in Trans.' Linn. Soc. ser. 2. ii. p. 150 (1884).

Huilla.—Rather poor thicket-grown pastures in the Lopollo district, on the right of the river; not plentiful; Feb. 1860. No. **6955**.

2. **B. aphyllanthoides** C. B. Clarke, *l.c.*, p. 611.

*Fimbristylis aphyllanthoides* Welw. ex Ridl., *l.c.*, p. 151.

Pungo Andongo.—Low sunny wooded hills near Condo, on the right of the river Cuanza; simulating *Statice*. Also Quisonde. March 1857. No. **6837**.

3. **B. schoenoides** C. B. Clarke, *l.c.*, p. 616.

*Fimbristylis Kunthiana* Ridl., *l.c.*

Huilla.—On low hills of decomposed sandy schist, near Nene; Nov. 1859. No. **6949**.

4. **B. melanocephala** C. B. Clarke, *l.c.*, p. 615.

*Fimbristylis melanocephala* Ridl., *l.c.*

Huilla.—In pastures among short herbage with species of *Xyris* and *Eriocaulon* on the way from Morro de Lopollo to Humpata; not elsewhere seen; April 1860. No. **6947**.

5. **B. cardiocarpa** C. B. Clarke, *l.c.*, p. 612.

*F. cardiocarpa* Ridl., *l.c.*, p. 154 (non F. Muell.).

Pungo Andongo.—Erect, 1½ ft. high, heads dull purple. In rather damp and lofty places on Pedras de Guinga; Jan. 1857. No. **6816**.

Huilla.—Lofty pastures of Morro de Monino; end of March 1860. No. **6948**. Rather damp herb-grown slopes of Morro de Monino; end of April 1860. No. **6960**.

6. **B. filamentosa** C. B. Clarke, *l.c.*, p. 613.

*Fimbristylis collina* Ridl., *l.c.*

Golungo Alto.—Simulating *Juncus Jacquinii*. Plentiful in lofty (2200 ft.) mountainous places covered with short grass and dwarf shrubs to the east of Quilombo-Quiacatubia, Sobato de Quilombo; end of Jan. 1855. No. **7004**. On the lofty slopes of the Queta mountains; Nov. 1855. No. **7004***b*.

Pungo Andongo.—Culms erect but weak and quivering, aggregated in loose tufts. In the higher pastures of the præsidium at the foot of Pedra de S. Antonio; Nov. 1856. No. **7151**.

7. **B. abortiva** C. B. Clarke, *l.c.*, p. 610.

*Fimbristylis flexuosa* Ridl., *l.c.*, p. 155.

Pungo Andongo.—An annual 2 ft. high, with fibrous root, striate culms, capillary rigidulous flexuose leaves and diffuse panicles. In almost dried-up marshes near Banza do Soba de Umbilla, but rather rare; March 1857. No. **6828** (in part). Damp wooded sparsely

grassed thickets between Candumba and Mangue ; March 1857. No. **6829**.

8. **B. capillaris** Nees in Mart. Fl. Brasil. ii. pt. 1. p. 84 (1842).
Var. **trifida** C. B. Clarke, *l.c.*, p. 612.
*Fimbristylis capillacea* Steud. Syn. Pl. Glum. ii. p. 111 (1855); Ridl., *l.c.*, p. 153.

Pungo Andongo.—Pedras de Guinga ; Jan. 1857. No. **6819**.

Huilla.—Plentiful in sandy short thicket-grown places between Empalanca and Humpata ; end of May 1860. No. **6958**. In pastures with short herbage, flooded in the rainy season. Only slightly developed at the beginning of Dec. 1859, but at the end of May 1860 growing everywhere about Empalanca. No. **6958***b*.

9. **B. parva** C. B. Clarke, *l.c.*, p. 615.
*Fimbristylis parva* Ridl., *l.c.*

Pungo Andongo.—Wet pastureland round the præsidium, Feb. to beginning of April, and in marshy places near Luxillo, April 1857. No. **6823** (in part). Wooded marshes near Quilanga ; Feb. 1857. No. **6831** (in part).

10. **B. Burchellii** C. B. Clarke, *l.c.*, p. 612.
*Fimbristylis Burchellii* Ficalh. & Hiern in Trans. Linn. Soc., *l.c.*, p. 28.
*F. huillensis* Ridl., *l.c.*, p. 154.

Huilla.—In the higher pastures of Empalanca, growing in dense masses over large areas with species of *Xyris* and *Ascolepis* ; March and April 1860. No. **6950**. Plentiful in thicket-grown pastures on the edges of woods at Catumba ; beginning of May 1860. No. **6951**.

11. **B. andongensis** C. B. Clarke, *l.c.*, p. 611.
*Fimbristylis andongensis* Ridl., *l.c.*, p. 153.

Pungo Andongo.—Annual, cæspitose, a span high, culms and leaves erect, slender, spikes more or less panicled. Rather damp shortly grassed pastures at the foot of Pedra Songue, near the stream Casengue; beginning of Jan. 1857. No. **6823** (in part). Densely cæspitose, hoary green, spikelets bearded with long white hairs. At the stream of Caghuy in secondary thickets ; middle of Jan. 1857. No. **6824**. No. **6827***b* (in part), no information.

Var. **glabra** Ridl., *l.c.* ; C. B. Clarke, *l.c.*
*F. quaternella* Ridl., *l.c.*, p. 152.

Pungo Andongo.—Sunny wooded places between Condo and Quisonde ; March 1857. No. **6820**. Pedra Cambondo, Feb. ; Muta Lucala, March 1857. No. **6821**. Cæspitose among *Dicranum sphagnoideum* in short-grassed pastures on the volcanic rocks of the præsidium ; Jan. 1857. No. **6825**. Pedras de Guinga ; Jan. 1857. No. **6827***b* (in part). Marshy places in the præsidium ; Feb. 1857. No. **6830**. Pedras de Guinga, March 1857. No. **6830***b*.

12. **B. megastachys** C. B. Clarke, *l.c.*, p. 614.
*Fimbristylis megastachys* Ridl., *l.c.*, p. 156.

Huilla.—Plentiful in rather dry low hills at the edges of woods near Catumba ; end of March and beginning of May 1860. No. **6952**.

13. **B. oritrephes** C. B. Clarke, *l.c.*, p. 615.
*Fimbristylis oritrephes* Ridl., *l.c.*, p. 155.

GOLUNGO ALTO.—Very plentiful in lofty short-grassed mountain places (about 2,200 ft.) at the east of Banza de Quilombo, Sobata Quilombo ; long past flowering, end of Jan. 1855. No. **7016.** On the short-grassed slopes of the Queta mountains ; Nov. 1855. No. **7020.**

14. **B. trabeculata** C. B. Clarke, *l.c.*, p. 616.

*Fimbristylis barbata*, var. *subtristachya* Ridl., *l.c.*, p. 152.

LOANDA.—A very slender plant ; heads with 3 to 4 spikelets in a two-leaved involucre. Plentiful in gravelly soil on the island of Casanga or Caçanga, south of Loanda ; 30 April 1854. No. **6982.** Here and there on the sandy sea-shore of Praia de Zamba Grande and Maianga d'El Rei ; 13 Feb. 1858. No. **7000.** A cæspitose annual, 3 to 5 in. high ; spikelets linear-lanceolate, laxly cymose, somewhat fuscous. Praia de Zamba Grande ; May 1858. COLL. CARP. 1115.

MOSSAMEDES.—Cabo Negro. Rather damp places on the banks of the river Caroca (now almost dried up), but not very plentiful ; Sept. 1859. No. **6962.**

9. **SCIRPUS** L. ; Benth. & Hook. f. Gen. Pl. iii. p. 1049.

*Hemicarpha* Nees ; Benth. & Hook, *l.c.*, p. 1053.

1. **S. fluitans** L. Sp. Pl. p. 48 (1753) ; Ridl. in Trans. Linn. Soc. ser. 2. ii. p. 156 ; C. B. Clarke in Durand & Schinz, Consp. Fl. Afr. v. p. 621.

HUILLA.—Sometimes growing erect and widely cæspitose in the mud, sometimes floating in very great tufts in the river. Caryopsis obovate-orbicular, evidently stalked, biconvex and subcompressed, slightly thickened round the margin, faces smooth, apex mucronulate with the thickened style-base. Plentiful on the sandy-clayey banks and in the water of the river Quipumpunhime, Sobato Humpata, decorating extensive areas with a very pleasant green ; Oct. 1859. No. **6965.** 3 to 5 ft. long ; plentiful in streams on the Humpata plain ; 21 March 1860. No. **6966.** Stream-swamps near Mumpulla growing with *Ottelia*, *Xyris*, and *Juncus* ; Oct. 1859. No. **6967.**

2. **S. angolensis** C. B. Clarke, *l.c.*, p. 617.

*S. spadiceus* Boeck., var. *ciliatus* Ridl., *l.c.*

PUNGO ANDONGO.—Spikes very compact, deep purple, almost black when alive. Damp lofty pastures of Pedra Songue and Cazella, Jan. and Feb. ; marshy places in the heights of Pedra Songue, April 1857. No. **6836.** Growing in dense masses in rather damp soil on rocks covered with short herbage near Catete in the præsidium. No. **7166.**

3. **S. articulatus** L., *l.c.*, p. 47 ; Ridl., *l.c.*, p. 157 ; C. B. Clarke, *l.c.*, p. 618.

*S. articulatus* var. *major* Boeck. in Linnæa xxxvi. p. 702 (1869-70) ; Ridl., *l.c.*

CONGO.—Widely cæspitose on the edges of the pool Lagoa de Quizemba, growing with *Cyperus articulatus* ; Nov. 1853. No. **6978.**

ICOLO E BENGO.—Plentiful on the marshy margin of Lagoa de Funda ; Sept. 1854. Nos. **6851, 6979.**

PUNGO ANDONGO.—Very rare in the loftier woods of Pedras de Guinga, round deep ponds growing with Lythraceæ ; Mar. 1857. No. **6850.**

4. **S. corymbosus** Heyne ex Roth. Nov. Pl. Sp. p. 28 (1821) ; Ridl., *l.c.*, p. 158 ; C. B. Clarke, *l.c.*, p. 620.

*S. corymbosus*, var. *microstachyus* Boeck., *l.c.*, p. 706.

Ambaca.—Leafless, 3 ft. high, rhizome creeping, sterile culms subulate. By pools near the right bank of the river Lucala; 17 Oct. 1856. No. **6846**.

Cazengo.—6 to 10 ft. high. Principally used in the manufacture of matting. By and in mountain streams near Palmira; Dec. 1854. No. **7015**.

Golungo Alto.—Varzea do Isidro, near Sange; Feb. 1856. No. **7015***b*.

Pungo Andongo.—Marshes between Condo and Quisonde, not far from the river Cuanza; Mar. 1857. No. **6849**.

Huilla.—On the banks of Lake Ivantâla growing with species of *Polygonum* and floating Commelineæ; end of Feb. 1860. No. **6976**. Plentiful in marshes by the river of Catumba towards Hay, growing with *Typha* and near species of *Ottelia*; beginning of May 1860. No. **6977**.

5. **S. litoralis** Schrad. Flor. Germ. i. p. 142 (1806); C. B. Clarke, *l.c.*, p. 625.

*S. subulatus* Vahl Enum. Pl. ii. p. 268 (1806); Ridl., *l.c.*

Pungo Andongo.—Rush-like, leafless, 4 ft. and higher; rhizome tuberous, stoloniferous. Salinas do Dungo, near Quitage. Marshy meadows on the river Cuanza, near N-billa; Mar. 1857. No. **6847**.

Mossamedes.—8 to 9 ft. and even higher, rhizome horizontal creeping, culms erect cylindrical, as thick as the middle finger, very glaucous. Deep ponds, both brackish and fresh, near Aguadas; beginning of July 1859. No. **6973**.

6. **S. maritimus** L., *l.c.*, p. 51; Ridl., *l.c.* (including vars.); C. B. Clarke, *l.c.*, p. 626.

Congo.—Damp thickets near Quizembo, far from the sea and even from the river Quizembo, growing with species of *Kyllinga* and a species of *Convolvulaceæ*; Nov. 1853. No. **6992**. Lagoa de Quizembo; Nov. 1853. No. **7003**.

Icolo e Bengo.—2 to 3 ft. high, root tuberous. Plentiful at Lagoa da Funda, near Funda; beginning of Dec. 1857. No. **6980**. Flooded marshes on the left of the river Bengo, near Funda; Sept. 1854. No. **7011**.

Mossamedes.—One of the most troublesome weeds in the cotton fields; July 1859. No. **6972**. Marshy ground not far from the Atlantic, near Giraûl; July 1859. No. **6974**.

Var. **nobilis**, C. B. Clarke, *l.c.*, p. 627.

*S. nobilis* Ridl., *l.c.*, p. 159.

Mossamedes.—6 to 12 ft. high, plentiful on the banks of the river Maiombo, where it forms very dense small forests; Oct. 1859. No. **6975**.

7. **S. cubensis** Poepp. & Kunth ex Kunth Enum. ii. p. 172 (1837); Ridl., *l.c.*, p. 157; C. B. Clarke, *l.c.*, p. 620.

Barra do Dande.—A foot high, obscurely green, rhizome creeping, culm ascending covered at the base by the broad lax distichous leaf-sheaths. Heads yellowish, very compact with a dark purple shining involucre. Rather rare (seen only in one locality), in damp ground on the right bank of the river Dande, after the retreat of the flood, near Bombo; Sept. 1858. No. **6994**.

Pungo Andongo.—Growing with a species of *Phrynium* in marshes near Umbilla, on the river Cuanza, Quisonde; Mar. 1857. No. **6848**.

8. **S. Hystrix** Thunb. Prodr. Pl. Capens. p. 17 (1794); C. B. Clarke, *l.c.*, p. 623.

*S. Rehmanni* Ridl., *l.c.*, p. 159.

Huilla.—Heads green, very plentiful in damp clayey-sandy fields round Lopollo after corn harvest; end of May 1860. No. **6771**.

9. **S. Isolepis** Boeck., *l.c.*, p. 498.

*Hemicarpha Isolepis* Nees in Edinb. N. Phil. Journ. xvii. p. 263 (1834); Ridl., *l.c.*, p. 161.

Pungo Andongo.—Sansamanda; Apr. 1857. No. **6814**. Growing in marshy places, Lombe; Mar. 1857. No. **6815**. Wooded meadows between Condo and Quisonde; Mar. 1857. No. **6818**.

Huilla.—Growing with Xylideæ etc., in places flooded in the rainy season in the short-grassed lofty meadows of Empalanca; beginning of May 1860. No. **6963**.

10. **S. micranthus** Vahl, *l.c.*, p. 254; C. B. Clarke, *l.c.*, p. 627.

*Hemicarpha subsquarrosa* Nees in Mart. Fl. Bras. ii. Pt. 1. p. 61 (1842); Ridl., *l.c.*, p. 162.

Loanda.—Sandy-clayey places on the margins of ponds near Conceiçao, but not plentiful. Almost past flowering; 12 July 1854. No. **6981**. No. **6996** (no notes).

10. **FUIRENA** Rottb.; Benth. & Hook. f. Gen. Pl. iii. p. 1053.

1. **F. chlorocarpa** Ridl. in Trans. Linn. Soc. ser. 2. ii. p. 159; C. B. Clarke in Durand & Schinz, Consp. Fl. Afr. v. p. 645.

Huilla.—Marshy places on the edges of fields in Lopollo; Colonel Kneissmann's garden; beginning of April 1860. No. **7113**.

2. **F. Welwitschii** Ridl., *l.c.*, p. 161; C. B. Clarke, *l.c.*, p. 649.

Pungo Andongo.—Very slender erect with creeping perennial root-stock and greyish spikes. Marshes near Quibanga; Jan. 1857. No. **7108**.

Huilla.—Wooded pastures of Monino, and rather damp grassy slopes of Morro de Monino; April 1860. No. **7109**. Plentiful in rather damp pastures near Lopollo; Dec. 1859 and Jan. 1860. No. **7114**. Low rather dry sandy hills near Eme; end of Feb. 1860. No. **7115**.

3. **F. pubescens** Kunth Enum. ii. p. 182 (1837); Ridl., *l.c.*, p. 160; C. B. Clarke, *l.c.*, p. 648.

Golungo Alto.—3 to 4 ft. high, culm triquetrous flaccid, scrambling among the tall herbs of the marshy meadows (Varzeas) on the river Cassaballa, Sobato de Bumba, where also Mungo grows; Oct. 1855. No. **7116**.

4. **F. pygmæa** Welw. ex Ridl., *l.c.*; C. B. Clarke, *l.c.*

Pungo Andongo.—Sansamanda; Feb. and April 1857. No. **7111**. Grassy wooded sandy marshes between Mopopo and Sansamanda; May 1857. No. **7171**.

Huilla.—Growing in masses in rather damp sunny wooded places covered with a dull blood-red *Scytonema* at Monino; April 1860. No. **7112**.

5. **F. glomerata** Lam. Ill. i. p. 150 (1791); Ridl., *l.c.*; C. B. Clarke, *l.c.*, p. 646.

Loanda.—Annual, glaucous green, the whole plant roughly hairy, culms obscurely 4-angled in the lower part, densely covered with horizontally spreading hairs. Rather rare at Represa de Maghelãos not far from Forte de Conceiçao; 12 July 1854. No. **7107**.

6. **F. umbellata** Rottb. Descr. et Icon. Pl. p. 70; C. B. Clarke, *l.c.*, p. 648.

Golungo Alto.—Culms 3 to 4 ft. high, acutely pentagonal, glaucescent, horizontally spreading like the leaves. Here and there in spongy places by streams near the town of Golungo Alto. Sange; in fl. end of Sept. 1854. No. **7121**.

Pungo Andongo.—Damp meadows near Umbilla (N-builla ?) on the right of the river Cuanza; March 1857. No. **7120**.

7. **F. cinerascens** Boj. ex Ridl., *l.c.*, p. 161; C. B. Clarke, *l.c.*, p. 645.

Huilla.—The whole plant somewhat fleshy and stiff. Damp wooded meadows of Catumba; end of March 1860; No. **7110**.

8. **F. pachyrrhiza** Ridl., *l.c.*; C. B. Clarke, *l.c.*, p. 647.

Pungo Andongo.—Marshes near Muta Lucala; March 1857. No. **7117**. Wooded marshy places between Caghuy and the river Cuanza growing with *Isoëtes*; April 1857. No. **7118**. Sansamanda, in spongy woods; May 1857. No. **7119**.

11. **LIPOCARPHA** R. Br.; Benth. & Hook. f. Gen. Pl. iii. p. 1054.

1. **L. argentea** R. Br. in Tuckey's Congo Exped. p. 459 (1818); Ridl. in Trans. Linn. Soc. ser. 2. ii. p. 163 (1884); C. B. Clarke in Durand & Schinz, Consp. Fl. Afr. v. p. 649.

Pungo Andongo.—A very widely cæspitose herb with erect culms and hard compact greenish-white spikes. At the stream of Calunda in the rocky valleys of the præsidium; middle of Jan. 1857. No. **6778**.

Huilla.—Heads compact, whitish; caryopsis oblong-subclavate, obtusely triangular, chestnut-coloured, polished, with a disc-like stalk. Rather rare at wooded ponds in the mixed woods of Monino; end of March 1860. No. **6777**.

2. **L. albiceps** Ridl., *l.c.*, C. B. Clarke, *l.c.*

Pungo Andongo.—Muta Lucala on the river Cuanza; March 1857. No. **6782** Spongy slopes of the præsidium mixed with *Ascolepis* and other Glumaceæ. Heads snow-white. Dec. 1855. No. **6785** (in part). Swampy meadows growing with *Ascolepis* near Catete, March 1857, and Sansamanda, Feb. 1857. No. **6786**.

3. **L. purpureo-lutea** Ridl., *l.c.*; C. B. Clarke, *l.c.*, p. 650.

Huilla.—Heads yellowish, deep purple at the base. In thicket-grown pastures flooded in summer near Humpata; end of March 1860. No. **6784**.

4. **L. sphacelata** Kunth Enum. ii. p. 267 (1837) (*sphacilata*); Ridl., *l.c.*, p. 162; C. B. Clarke, *l.c.*, p. 650.

Pungo Andongo.—Plentiful in damp rather sandy meadows near Mopopo on the river Cuanza, April 1857; and at Lombe, March 1857. No. **6776**.

5. **L. atra** Ridl., *l.c.*; C. B. Clarke, *l.c.*

Huilla.—Wet places by the banks of the river Cacolovar, near Lake Ivantâla, but not plentiful; end of Feb. 1859. No. **6961**. Afterwards (April) picked in sandy ground near Humpata.

6. **L. pulcherrima** Ridl., *l.c.*; C. B. Clarke, *l.c.*

Pungo Andongo.—Swampy meadows near the præsidium, growing

with *Ascolepis*, Dec. 1856; and sunny marshes in the præsidium, and near Quilanga; Feb. 1857. No. **6774**. Marshes at Catete; Feb. 1857. No. **6785** (in part).

HUILLA.—Very plentiful in sandy-clayey fields after a crop of *Sorghum*; growing with many other Scirpoideæ and species of *Eriocaulon*, forming dense cushions; April and May 1860. No. **6775**.

7. **L. multibracteata** C. B. Clarke, *l.c.*

*Ascolepis pusilla* Ridl., *l.c.*, p. 164 pro parte.

HUILLA.—Plentiful in fields after the *Sorghum* harvest; end of May 1860. No. **6773**.

12. **ASCOLEPIS** Nees; Benth. & Hook. f. Gen. Pl. iii. p. 1054.

1. **A. protea** Welw. in Trans. Linn. Soc. xxvii. p. 75 (1869); C. B. Clarke in Durand & Schinz, Consp. Fl. Afr. v. p. 652.

PUNGO ANDONGO.—Heads a splendid snow-white. In the higher rocky somewhat spongy pastures of the præsidium near Tunda Quilombo. Plentiful in fl. Nov. and Dec. 1856. No. **1667**.

HUILLA.—Plentiful in rather damp rocky pastures, growing with *Isoetes huillensis* and Commelinaceæ in lofty places at Empalanca. In fl. and fr. Feb. and April 1860. No. **1671**. Spongy wooded meadows near Lopollo; April 1860. COLL. CARP. 1063.

Var. *β.* **bellidiflora** Welw., *l.c.*, p. 76; C. B. Clarke, *l.c.*

*Antrolepis leucantha* Welw., *l.c.*, p. 77.

*A. leucocephala* Welw. Apont. p. 578 (nomen in nota 3).

PUNGO ANDONGO.—Plentiful in rather spongy places among gigantic rocks on the heights near Tunda Quilombo in the præsidium; beginning of Jan. 1857. No. **1667***b*. Flowers a splendid snow-white. Very plentiful on spongy slopes grown with short herbage at the foot of huge rocks, Barrancos de Catete; in fl. and fr. Jan. and Feb. 1857. No. **1668**.

HUILLA.—Heads a splendid snow-white, very elegant. Plentiful in rather damp shortly herb-grown pastures between Lopollo and Nene on the way to Humpata; in fl. and fr. May 1860. No. **1672**.

Var. *γ.* **santolinoides** Welw. in Trans. Linn. Soc., *l.c.*; C. B. Clarke, *l.c.*

*Antrolepis sulphurea* et *A. santolina* Welw. Apont. *l.c.* (nomina).

PUNGO ANDONGO.—Heads sulphur-coloured or golden, resembling when alive those of species of *Santolina*. Very plentiful in marshy places, and in the spongy slopes and meadows of the præsidium, especially near Catete; in fl. Jan. and Feb., in fl. and fr. March 1857. No. **1664**. Heads yellow. Damp spongy meadows on the river Cuanza near Sansamanda; in fl. and fr. Jan. 1857. No. **1665**. Flowers sulphur-coloured, sometimes rather pale. Very plentiful in wet spongy places and spongy short-grassed slopes near the foot of the rocks of the præsidium; in fl. and fr. Jan. 1857. No. **1666**. Damp pastures of the præsidium near Catete; in fr. Feb. 1857. COLL. CARP. 1073. Marshy meadows at Catete; June 1857. COLL. CARP. 1074. Marshy meadows on the river Cuije; March 1857. COLL. CARP. 170.

HUILLA.—Heads bright orange-yellow. Rather rare growing in somewhat spongy lofty meadows with species of *Disa*, at Morro de Lopollo at 5300 feet elevation; and in damp pastures near Lopollo; in fl. Feb. 1860. No. **1673**.

2. **A. anthemiflora** Welw. in Trans. Linn. Soc., *l.c.*, p. 77; C. B. Clarke, *l.c.*, p. 651.

*Antrolepis anthemiflora* Welw. Apont., *l.c.*

Pungo Andongo.—Plentiful on the marshy banks of the river Cuije, but not seen elsewhere in Angola. Growing with species of *Striga*, *Scleria*, and Commelinaceæ; in. fl. and fr. March 1857. No. **1669**.

3. **A. speciosa** Welw. in Trans. Linn. Soc., *l.c.*, p. 78; C. B. Clarke, *l.c.*, p. 652.

Huilla.—Heads a deep sulphur colour at flowering time, girt with a tawny gold margin in the fruiting stage. Very plentiful in rather damp lofty pastures flooded in the rainy season near Lopollo at about 5500 ft. elevation; growing with Thymelæaceæ; Jan. to April 1860. No. **1674**. Damp pastures near the Hippopotamus lake; June 1860. Coll. Carp. 4.

4. **A. elata** Welw., *l.c.*, p. 79; C. B. Clarke, *l.c.*, p. 651.

*Antrolepis elata* Welw. Apont., *l.c.*

Pungo Andongo.—Leaves pale greenish, flowers whitish, almost whitish-chestnut, not shining. Here and there in marshy meadows between Condo and Quisonde not far from the right bank of the Cuanza between 3500 and 3800 ft. Growing with *Drosera indica*, species of *Eriospermum*, *Xyris*, and *Anagallis pumila*; in fl. and fr. March 1857. No. **1670**.

5. **A. capensis** Ridl. in Trans. Linn. Soc. ser. 2. ii. p. 164 (1884); C. B. Clarke, *l.c.*, p. 651.

*Platylepis capensis* Kunth Enum. ii. p. 269 (1837).

Huilla.—A very elegant plant; heads snow-white, or milk-white, raised-hemispherical becoming ovoid. Very plentiful along with species of *Eriocaulon* in spongy meadows grown with short herbage on the way from Lopollo to Morro de Lopollo; in fl. and fr. Oct., Dec. 1859. No. **1676**. Marshy places near Ferrão da Sola; April 1860. No. **1676***b*. Heads milk-white ovoid obtuse compact. Specimens in good fruit. In spongy marshy places growing with species of *Disa* and *Habenaria* on the higher parts of Morro de Lopollo; in fl. and fr. Feb. to April 1860. No. **1677**. Serra d' Uiahoia; April 1860. No. **1677***b*. Simulating an *Eriocaulon*. Damp pastures of Lopollo; 30 Nov. 1859. Coll. Carp. 1065.

6. **A. pusilla** Ridl., *l.c.* pro parte; C. B. Clarke, *l.c.*, p. 652.

Huilla.—An annual scarcely 1½ in. high, culms sparsely cæspitose erect, flower-heads whitish. Poor wooded rather damp pastures round Lopollo and Monino. Scarcely in flower middle of April, in fr. beginning of May 1860. No. **1678**.

### Tribe III. *RYNCHOSPOREÆ*.

13. **RYNCHOSPORA** Vahl; Benth. & Hook. f. Gen. Pl. iii. p. 1058.

1. **R. aurea** Vahl Enum. Pl. ii. p. 229 (1806); Ridl. in Trans. Linn. Soc. ser. 2. ii. p. 165 (1884); C. B. Clarke in Durand & Schinz, Consp. Fl. Afr. v. p. 653.

Pungo Andongo.—In marshy places with a species of Scitamineæ. Quisonde on the Cuanza; March 1857. No. **6844**. Marshes of Lagoa de Quibinda, living in deep water; March 1857. No. **6845**.

2. **R. erinacea** C. B. Clarke, *l.c.*, p. 654.
*Schœnus erinaceus* Ridl., *l.c.*, p. 165, t. 23, figs. 5-9.

HUILLA.—Heads snow-white, bristling like a hedgehog. Woods among deep herbage near the stream of Monino and Mupanda. A *rara avis* seen only in this place. In fl. beginning of April 1860. No. **6788**.

3. **R. candida** Boeck. in Linnæa xxxvii. p. 605 (1873); C. B. Clarke, *l.c.*, p. 653.
*Dichromena candida* Ridl., *l.c.*, p. 149.

HUILLA.—Heads snow-white. Caryopsis crustaceous, lenticular, transversely rugose, crowned by the distinct very broad and dilated mitriform, spongy-waxy style-base. Rather damp wooded meadows of Monino and towards Catumba growing with *Scabiosa Columbaria* (Herb. No. 522) and various Labiatæ; March to May 1860. No. **6840**.

TRIBE IV. *SCHŒNEÆ*.

14. **REMIREA** Aubl.; Benth. & Hook. f. Gen. Pl. iii. p. 1058.

1. **R. maritima** Aubl. Pl. Gui. i. p. 45 (1775); Ridl. in Trans. Linn. Soc. ser. 2. ii. p. 165; C. B. Clarke in Durand & Schinz, Consp. Fl. Afr. v. p. 665.

CONGO.—Grows in dense masses with stolons 6 to 15 ft. long, and when not in flower resembles in habit some Portuguese species of *Statice*. On coarse sandy shores of the province Marquezado do Mosul, not far from the mouth of the river Onco or Onzo; Nov. 1853. No. **6990**.

TRIBE V. *SCLERIEÆ*.

15. **ACRIULUS** Ridl. in Journ. Linn. Soc. xx. p. 336 (1883).

1. **A. griegifolius** Ridl., *l.c.*, and in Trans. Linn. Soc. ser. 2. ii. p. 166, t. 22, figs. 1-5 (1884); C. B. Clarke in Durand & Schinz, Consp. Fl. Afr. v. p. 675.

HUILLA.—A male plant. Deeply herb-grown marshes on the river Cacolobar near Lake Ivantâla but apparently rather rare; Feb. 1860. No. **6959**.

16. **ERIOSPORA** Hochst. ex A. Rich.; Benth. & Hook. f. Gen. Pl. iii. p. 1070.

1. *E. abyssinica* Hochst. ex A. Rich. Tent. Fl. Abyss. ii. p. 508 (1851); Ridl. in Trans. Linn. Soc. ser. 2. ii. p. 166; C. B. Clarke in Durand & Schinz, Consp. Fl. Afr. v. p. 676.

LOANDA.—No information. No. **7157** (in part)

PUNGO ANDONGO.—A widely cæspitose perennial 1 to 3 ft. high, with somewhat erect or nodding culms, and subfleshy-coriaceous highly-polished leaves. On the rocky slopes of all the rocks of the præsidium; 18 Dec. 1856. Plentiful in the fissures of rocks on the heights of the præsidium; in fl. March and April 1857. No. **6841**.

17. **SCLERIA** Berg.; Benth. & Hook. f. Gen. Pl. iii. p. 1070.

1. **S. catophylla** C. B. Clarke in Durand & Schinz, Consp. Fl. Afr. v. p. 670.
*S. hirtella* Sw. var. *aterrima* Ridl. in Trans. Linn. Soc. ser. 2. ii. p. 166 (1884).

HUILLA.—Heads black and very hispid. Plentiful on the higher

spongy slopes in the mixed woods of Morro de Lopollo, but only seen in this place ; March and April 1860. No. **7143**.

2. **S. Meyeriana** Kunth Enum. ii. p. 354 (1837); C. B. Clarke, *l.c.*, p. 673.

*S. cæspitosa* Welw. ex Ridl., *l.c.*, p. 167.

Pungo Andongo.—A widely cæspitose annual; culms 2 ft., very rarely 3 ft. high, erect, unbranched, ending in a long interrupted spike ; leaves erect, very narrow, sparsely pilosulose. Achene brightly polished, obtusely mucronate. Plentiful in marshy wooded meadows between Condo and Quisonde ; March 1857. No. **7135**. Higher damp slopes of Funda-Quilombo in the præsidium ; April 1857. No. **7131** (in part).

Huilla.—In the deeply herb-grown woods of Monino, seen only in one place ; end of Jan. 1860. No. **7137** (in part).

3. **S. bulbifera** Hochst. ex A. Rich. Tent. Fl. Abyss. ii. p. 510 (1851); C. B. Clarke, *l.c.*, p. 669.

*S. bulbosa*, var. *pallidiflora* Ridl., *l.c.*, p. 167.

Pungo Andongo.—Habit of *Carex arenaria* and allies ; rhizome tuberous, stoloniferous, leaf-sheaths and leaves hairy, culm 3 ft., more rarely 4 ft., erect, angled, glomerules of spike whorled or half-whorled, distant, nuts white, smooth. Damp meadows of a peculiar kind, consisting only of very slender grasses, near Sobato de Muta-Lucala, but not seen elsewhere ; March 1857. No. **7133**.

4. **S. Dregeana** Kunth, *l.c.* ; Ridl., *l.c.* ; C. B. Clarke, *l.c.*, p. 670.

Huilla.—Achene very smooth and polished, mucronate. Deeply herb-grown woods of Monino, seen only in one place ; end of Jan. 1860. No. **7137** (in part).

5. **S. erythrorrhiza** Ridl., *l.c.* ; C. B. Clarke, *l.c.*

Huilla.—Achene smooth. Sporadic in wooded meadows near the base of Morro de Ferrão da Sola ; Jan. 1860. No. **7136**.

6. **S. multispiculata** Boeck. Cyper. Nov. i. p. 36 (1888); C. B. Clarke, *l.c.*, p. 673 (*multispiculosa*).

Pungo Andongo.—Two feet high ; culms and leaves erect, very slender. Plentiful in marshy places near Quibanga ; Jan. 1857. No. **7132**.

Huilla.—Achene tubercled. Meadows on the banks of the river Quipumpunhime, Sobato de Humpata ; a *rara avis*. A few specimens found in the beginning of April 1860. No. **7140** (in part).

7. **S. Welwitschii** C. B. Clarke, *l.c.*, p. 675.

*C. junciformis* Welw. ex Ridl., *l.c.*, p. 168 (non Thwaites).

Huilla.—Achene very smooth. Deep grass-grown wooded meadows near Catumba ; end of March 1860. No. **7138**. Plentiful in marshy meadows from Monino on the way to Eme ; Jan. and Feb. 1860. No. **7139**.

8. **S. Woodii** C. B. Clarke, *l.c.*

Huilla.—Achene tubercled. Meadows near the banks of the river Quipumpunhime, Sobato de Humpata ; a *rara avis* ; beginning of April 1860. No. **7140** (in part).

9. **S. ustulata** Ridl., *l.c.* ; C. B. Clarke, *l.c.*

Pungo Andongo.—Annual, erect, not cæspitose. Spikes variegated with yellow, dull brown and black. Achenes trigonous, papillose-

echinulate. With *Drosera indica* in damp woods where *Andropogon* grows on the banks of the river Cuanza ; 12 March 1857. No. **7134**.

10. **S. pulchella** Ridl., *l.c.* ; C. B. Clarke, *l.c.*, p. 674.

Huilla.—Achene prickly. With *Eriocaulon*, and species of *Xyris* on the lofty short-grassed pastures of Empalanca ; Dec. 1859, March and May 1860. No. **7141**.

11. **S. remota** Ridl., *l.c.*, p. 169 (cum var. *hispida*), C. B. Clarke, *l.c.*

Pungo Andongo.—Apparently annual, erect, cæspitose ; leaves strictly erect, hairy, broadly channelled, acutely keeled, and yellowish-green like the whole plant ; culms acutely triquetrous with striate sides and with spreading hairs on the angles, never branched. Nut with a thick stalk, globose-trigonous, membranes subprominent horizontally multicostate and muriculate. Plentiful but only in one locality in spongy rocky places near Catete ; 28 Feb. 1857. No. **7130**. Achene prickly and mucronate. In damp wooded meadows between Serra de Pedras de Guinga and Candumba ; March 1857. No. **7129**. Annual, culms 1 ft., erect, 2 to 5 growing from the same root, spike elongated, interrupted, spikelets half-whorled, dull brown. Higher damp slopes of Funda-Quilombo in the præsidium ; April 1857. No. **7131** (in part). Growing among mosses with another scirpoid plant on the heights of Pedra Songue ; April 1857. No. **7131***b*.

12. **S. foliosa** Hochst. ex A. Rich., *l.c.*, p. 509 ; Ridl., *l.c.*, p, 170 ; C. B. Clarke, *l.c.*, p. 670.
*S. dumicola*, Ridl., *l.c.*, p. 169.

Pungo Andongo. — Achenes snow-white, rugulose-tuberculate. Rather rare in thicket-grown marshes between Quilanga and Pedras de Guinga ; Jan. 1857. No. **7122**. Achenes deeply and closely pitted. Damp meadows on the banks of the Cuanza near Muta-Lucala ; March 1857. No. **7123**.

13. **S. clathrata** Hochst. ex A. Rich., *l.c.*, p. 510 ; Ridl., *l.c.*, p. 170; C. B. Clarke, *l.c.*

Pungo Andongo.—Achenes snow-white, longitudinally furrowed. Widely cæspitose in the higher marshy wooded meadows of Pedra de Guinga and Matta de Quilanga, Feb., between Caghuy and Sansamanda growing with *Isoetes æquinoctialis*, April and May 1857. No. **7124**.

14. **S. poæoides** Ridl., *l.c.*, (*poæoides*) ; C. B. Clarke, *l.c.*, p. 674.

Huilla.—Perennial, rhizome and root-fibres blood-red when alive, somewhat fleshy ; culms cæspitose very slender triquetrous, panicles lax, achene tuberculate crowned with a truncate mucro. Plentiful in sandy-spongy places at Quilebe near Huilla ; in fl. and fr. end of Nov. 1859. No. **7142**. Smells like lemon when rubbed. Damp meadows near Catumba ; April 1860. Coll. Carp. 1076.

15. **S. melanomphala** Kunth, *l.c.*, p. 345 ; Ridl., *l.c.*, p. 171 ; C. B. Clarke, *l.c.*, p. 672.

Pungo Andongo.—Perennial, 2½ to 3½ ft. high. On the marshy banks of small streams in wooded places near Quilongo but not plentiful ; Feb. 1857. No. **7145**.

Huilla.—4 ft. high, cæspitose ; spikes nodding ; glumes a splendid

purple ; achenes like alabaster. Plentiful at the cataracts of streams near Lopollo ; beginning of Dec. 1859, Feb. 1860. No. **7144**.

16. **S. canaliculato-triquetra** Boeck. in Flora lxii. p. 573 (1879) ; C. B. Clarke, *l.c.*, p. 670.

*S. cervina* Ridl., *l.c.*

Pungo Andongo.—Perennial. Marshy places near Quibanga ; Jan. 1857. No. **7126**. Achenes snow-white, quite smooth. Spongy places between Mutollo and Candumba ; March 1857. No. **7127**.

17. **S. ovuligera** Nees in Linnæa ix. p. 303 (1835) ; C. B. Clarke, *l.c.*, p. 673.

*S. Flagellum* Benth. in Hook. Niger Fl. p. 555 (1849) ; Ridl., *l.c.* (non Sw.).

Ambriz.—*Scleria Flagellum* Sw. ? but the culms are certainly not climbing. Achenes faintly pitted at the top. Damp rocks between Ambriz and Quizembo ; Nov. 1853. No. **7125**.

18. **S. racemosa** Poir. Encycl. vii. p. 6 (1806) ; C. B. Clarke, *l.c.*, p. 674.

*S. palmifolia* Ridl., *l.c.* (non Schlecht.).

Golungo Alto.—Poco ian Zambi. 5 to 8 ft. high, culm triquetrous, angles very sharp, formed by the winged decurrent keels of the leaves, nutlets very hard, whitish, excepting the cupule and remains of the perianth. Sharp as a razor. Marshes on the banks of the river Cuango near Sange ; Dec. 1854, in fl. and fr. July 1855. No. **7128**. Same locality Dec. 1854. Coll. Carp. 1075.

## XXVIII. GRAMINEÆ.

### Tribe 1. *ANDROPOGONEÆ*.

1. **IMPERATA** Cyril. ; Benth. & Hook. f. Gen. Pl. iii. p. 1125.

1. **I. arundinacea** Cyril. Pl. Rar. Neap. fasc. 2. p. 27 (1792).

*I. cylindrica* Beauv. Agrost. p. 8 (1812) ; Durand & Schinz, Consp. Fl. Afr. v. p. 693.

Var. **Thunbergii** Hack. ex Durand & Schinz, *l.c.*

Var. *genuina*. Subvar. *Thunbergii* Hack. Mon. Androp. p. 94 (1889).

Loanda.—In Capimeta on the river Bengo near Panda ; Dec. 1853. No. **7354**.

Golungo Alto.—Springs up in great abundance after the fires by which the inhabitants render fertile their fields, and infests the fields in very dense tufts ; called Senu by the natives. Common in fields after the fires, near Sange and everywhere ; Nov. 1854. No. **7179**. A grass 2 to 4 ft., perennial, soon springing up in great quantity after fires in primæval woods, growing in dense masses and suffocating all the plants in the place. Leaves subglaucous, narrow, erect. The leaves serve as a lining for wickerwork of various kinds, such as small baskets, etc. Very common in abandoned fields in the whole district. Senu of the natives. Bumba ; in fl. Oct. 1855. No. **7189**. No. **7229** (no notes).

Huilla.—In wooded places, and abandoned fields near Lopollo and at Lake Ivantàla ; Jan. 1859, Feb. 1860. No. **2640**.

2. **SACCHARUM** L.; Benth. & Hook. f. Gen. Pl. iii. p. 1125.

1. **S. officinarum** L. Sp. Pl. p. 54 (1753); Hack. Mon. Androp. p. 111; Durand & Schinz, Consp. Fl. Afr. v. p. 694.

Golungo Alto.—In sugar plantations on the banks of the Luinha: Dec. 1855. No. **2901**.

Mossamedes.—*Saccharum violaceum?* Culm straw-yellow streaked longitudinally with purple-violet bands. Cultivated commonly for sugar and brandy, formerly introduced from Brazil by Portuguese colonists. Called by the inhabitants Canna imperialis. Fazenda de Purificaçaõ near Cavalheiros; 27 Aug. 1859. No. **2283**.

2. **S. Munroanum** Hack., *l.c.*, p. 124; Durand & Schinz, *l.c.*, p. 694. *Eriochrysis pallida* Munro in Harvey Gen. S. Afr. Pl. ed. ii. p. 440 (1868).

Huilla.—Two feet high, widely cæspitose, with the habit of *Holcus*, spikes a tawny gold colour. Common in peaty places about Humpata; beginning of Dec. 1859. Common in wooded damp rather peaty meadows between Lopollo and the river Monino; conspicuous from its splendid gold colour; Nov. 1859, Jan. and Feb. 1860. No. **2642**.

3. **POLLINIA** Spr.; Benth. & Hook. f. Gen. Pl. iii. p. 1127.

1. **P. villosa** Spreng. Syst. Veget. i. p. 288 (1825); Hack. Mon. Androp. p. 157.

*Eulalia villosa* Nees Fl. Afr. Austr. p. 91 (1841).

Huilla.—On rocks in the mountainous district of Morro de Monino, but seen only in one place; April 1860. No. **7435**.

2. **P.** (§ **Eulalia**) **huillensis** Rendle sp. nov.

Perennial from a nodose creeping rhizome bearing remains of old shoots above and numerous tough wiry roots, with a shorter leafy shoot and a long slender terete culm ending in the inflorescence; lowest sheath glabrous, broad, loose below, becoming narrower and convolute in the upper half and passing imperceptibly into the convolute terete setiform blade; ligule membranous, pyramidal with a truncate retuse apex; sheaths of cauline leaves becoming longer and blades shorter; inflorescence of 3 fasciculate spikes, on a very much shortened common axis; spikelets one-flowered, more or less tinged with purple and thinly covered with white silky hairs; pedicel and rhachis-joint similarly hairy, slender, subequal; glume I. oval-oblong tapering above with narrowly incurved edges forming submarginal slightly prominent keels, and 5 subprominent green nerves on the shallowly rounded back, callus clavate with densely hairy edges about one-fifth the length of the glume; gl. II. narrower than the outer, 3-nerved slightly monocarinate with inrolled shortly hairy margins otherwise glabrous; gl. III. hyaline, oblong-ovate, tapering gradually upward to a blunt rounded apex, 2-nerved with 2 marginal keels which are densely shortly hairy in the upper part; fertile glume narrowly linear-lanceolate, hyaline, 3-nerved, entire, the upper third thickened and passing into a flexuose awn more than four times the length of the spikelet; awn yellowish and shortly hairy

in the stouter lower half, brown and glabrous above; pale very short, truncate, broad, lodicules shortly cuneate.

Culm 40 in. long below the inflorescence, 1 line in diameter at the base; basal sheath 5 in. long, ligule 1 line, blade nearly 18 in. long, $\frac{1}{2}$ line broad at the base, involute edges sparsely pilose; blade of next higher leaf 19 in., in the upper ones rapidly becoming shorter. Spikes 4 in. or less in length, common axis $\frac{1}{4}$ in. long; pedicel stalked, spikelet 2 lines long, rhachis-joint 2 to 3 lines. Outer glume a little over $\frac{1}{4}$ in. ($\frac{5}{16}$) long, the blunt apex pale purple, hyaline the rest membranous greenish becoming purple in lower half; gl. II. a shade longer than the outer; the others $\frac{1}{4}$ in.; awn $1\frac{1}{2}$ in. long; pale less than $\frac{1}{16}$ in.

Comes nearest to *P. villosa* Spreng., but is at once distinguished by its long setiform leaves and membranous outer glumes.

Huilla.—In thicket-grown pastures near Empalanca; but very sparingly; May 1860. No. **2669**.

4. **ELIONURUS** Humb. & Bonpl.; Benth. & Hook. f. Gen. Pl. iii. p. 1129.

1. **E. Royleanus** Nees ex A. Rich. Tent. Fl. Abyss. ii. p. 471 (1851); Hack. Mon. Androp. p. 343; Durand & Schinz, Consp. Fl. Afr. v. p. 702.

St. Vincent, Cape Verde Islands.—Laxly cæspitose, 2 to 3 in. high, bright red. Grows sparsely on sandy hills behind Villa de Mindello; Jan. 1861. No. **2885**.

2. **E. Welwitschii** Rendle sp. nov.

Perennial from a hard woody rhizome ending in new leafy shoots enveloped in purplish sheaths; culm tall slender erect, bearing at the upper nodes solitary or fascicled thin wiry branches ending in the single spikelike inflorescence, nodes glabrous; leaf-sheaths membranous, glabrous, striate, rather loose, shorter than the long internodes, which are shallowly grooved on the inner side; ligule short, membranous, truncate, shortly ciliate; lamina long, narrowly linear, plicate, keeled above, margin and keel scabridulous, apex setiform; spike dense, rhachis fragile, joints shortly pubescent on the margin; sessile spikelet slightly exceeding the rhachis-joint, ovate-lanceolate, glabrous except for the shortly densely ciliolate marginal keels of the outer glume; outer glume emarginate with a dark balsamiferous streak just inside the keels; pedicelled spikelet similar to the sessile but slightly smaller, and barren.

Stem to 4 ft. in height, with internodes 4 to 10 in. long; sheaths passing gradually into the blades which may exceed 1 ft. in length, with a width of 1 line gradually diminishing to the setiform apex. Spikes $3\frac{1}{2}$ in. long or shorter, by 1 line wide; rhachis-joint 2 lines long by $\frac{1}{3}$ line wide; sessile spikelet $2\frac{1}{2}$ lines long; gl. I. ovate-lanceolate with an almost flattened faintly 5-nerved back and sharply inflexed keeled margins, embracing the inner subequal barren glume, which is membranous, transparent, scaphoid, acute, with keeled midrib and two submarginal nerves

at which the narrow edges are inflexed; gl. III. hyaline, elliptico-lanceolate with 2 marginal nerves and sparsely ciliolate edges, 2 lines long; fertile glume similar but 3-nerved and only $1\frac{1}{2}$ line long, enclosing an epaleate ♀ flower. Pedicel of primary spikelet $1\frac{1}{2}$ line long, glabrescent, spikelet 2 lines long, obliquely lanceolate, similar to the sessile but the glumes are about $\frac{1}{5}$th smaller, and never seem to contain a flower.

A striking plant with the habit of *E. tripsacoides* Humb. but recalling in its almost glabrous spike *E. tristis* Hackel from Madagascar, which however is a much smaller plant.

PUNGO ANDONGO.—Candumba: March 1857. No. **2711**.

5. **ARTHRAXON** Beauv.; Benth. & Hook.f.Gen. Pl. iii. p.1128.

1. **A. ciliaris** Beauv. Agrost. p. 111 (1812); Hack. Mon. Androp. p. 354; Durand & Schinz, Consp. Fl. Afr. v. p. 703.

Leaves 1 to $1\frac{1}{4}$ in. long, from a base of about 3 lines broad, sparsely tuberculate at the base, surface otherwise almost glabrous. Spikes $1\frac{1}{4}$ to $1\frac{3}{4}$ in. long, sessile spikelet $\frac{2}{3}$ length of the glabrous rhachis-joint, lanceolate, 2 lines long, veins hirsutulous, awn a little shorter; second spikelet represented by a short punctum or obsolete.

Approaches nearest to Hackel's var. *a genuinus* (China and Japan), but the subspecies and varieties suggested by Hackel are not very satisfactory; the presence or absence of hairs on the rhachis seems pushed too far as a subspecific character.

GOLUNGO ALTO.—Perennial, prostrate, culms 3 to 6 ft., rooting at the nodes, new foliaceous and flowering branches ascending-erect. Flowers monœcious, the male occupying the lower, the female the terminal spikelets. Habit of *Cynodon*. Growing in thick masses, forming marshy meadows on the banks of the river Casaballa. In leaf Sept. 1855; fl. and fr. May 1856. No. **7214**.

6. **RHYTACHNE** Desv.; Benth. & Hook. f. Gen. Pl. iii. p. 1096.

1. **R. benguellensis** Rendle sp. nov.

Cæspitose; culms erect, wiry, unbranched, ending in the solitary spikelike inflorescence; leaves rigid, convolute, flagelliform, with a narrow cylindrical sheath and tapering to a setiform apex, glabrous except for a tuft of short white hairs at the mouth of the sheath; ligule membranous, very short and truncate; spike slender, glabrous; rhachis-joint slightly exceeding the sessile spikelet, clavate, hollow, plane of separation straight, small; pedicelled flower represented by the linear pedicel bearing a minute glumelike appendage, the whole equal in length to the rhachis-joint; sessile spikelet bluntly ovate, callus merely a line separated from the outer glume by a broader furrow: outer glume generally patent, hard with shallowly convex back and very narrow incurved edges, inconspicuously 7-nerved, deeply transversely muricate, markings decreasing upwards and absent below the generally minutely biapiculate apex; gl. II. equal to gl. I., papery, transparent, 3-nerved, scaphoid with shortly

apiculate apex; inner glumes hyaline, 2-nerved, slightly shorter than the outer, the lower elliptical with a subequal pale and a ♂ flower, the upper ovately elliptical, enveloping a shorter pale with a ♀ flower.

Shoots 16 to 20 in. high springing from the charred broad markedly striate barren glabrous leaf-sheaths which form a thick covering round their base; culms $\frac{1}{3}$ line or less in diameter, with generally three internodes, the median one clothed for two-thirds its length by the narrow leaf-sheath; leaf-blade on the short barren leafy shoots, which spring from the basal involucre of sheaths, reaching 14 in. in length, less than $\frac{1}{2}$ line in diameter, of the cauline leaves a few inches only. Spikes $2\frac{1}{2}$ to 3 in. long; rhachis-joints $2\frac{1}{2}$ lines; gl. I. of sessile spikelet $2\frac{1}{4}$ lines long, dingy purple; glume of ♂ flower scarcely $2\frac{1}{4}$ line, pale 2 lines long, anthers $1\frac{1}{2}$ line; fertile glume subequal, pale $1\frac{1}{2}$ line.

Near the west tropical African *R. rottboellioides* Desv., which has a very similar habit, but is distinguished by its larger, coarser-looking, perfectly glabrous, exaristate spikelets.

Huilla.—In sandy-clayey thicket-grown pastures between Humpata and Nene; April 1860. No. **2639**.

7. **ROTTBŒLLIA** Linn. f.; Benth. & Hook. f. Gen. Pl. iii. p. 1129.

1. **R. exaltata** Linn. f. Suppl. p. 114 (1781); Hack. Mon. Androp. p. 293; Durand & Schinz, Consp. Fl. Afr. v. p. 699.

Golungo Alto.—Too common in scanty thickets and on edges of woods, near Sange, Bango etc., said to be avoided by cattle; beginning of July 1855. Nos. **7251**, **7271**, **7271***b*.

Cazengo.—A tall grass 4 to 6 ft. high, beset with stinging hairs. Cucula; June 1855. Coll. Carp. 1110.

The stinging hairs (pili urentes) to which Welwitsch refers, are probably the sharp rigid hairs from a tuberculate base which frequently occur in the leaf sheaths, and are precisely similar to those common in Asiatic specimens. The character was sufficiently marked to suggest a specific name for what Welwitsch assumed to be a new plant.

2. **R. angolensis** Rendle sp. nov.

Perennial from a stout creeping rhizome, glabrous; culms tall reedy, clothed with the rather loose papery overlapping leaf-sheaths; ligule membranous, truncate, glabrous; blade tapering rapidly above the sheath, long, narrow linear, plicate, ultimately setiform; inflorescence carried above the leaves, main axis strong, terete, the spikelike branches few, long, lax, fastigiate, borne singly or in pairs on an elongated common axis; rhachis very brittle; spikelets in pairs at each node, similar; sessile spikelet about half the length of the rhachis-joint or shorter in proportion, outer glume separated from the short callus by a short horizontal

furrow, coriaceous, lanceolate, acuminate, almost shortly aristate, with a flattened or slightly-rounded inconspicuously 5-nerved back and short incurved edges bearing short sharp murications diminishing upwards; inner glume chartaceous, scaphoid, blunt; gls. III. and IV. hyaline, the former with a subequal pale, the latter similar to and enclosed by the inner barren glume, subtending a slightly shorter pale and ♀ flower.

Culms 4 ft. high, $\frac{1}{4}$ in. in diameter at the base; lowest sheath $5\frac{1}{2}$ to 6 in. long, the median reaching 10 in. with a blade 18 in. long. Ligule like the rest of the plant glabrous, $\frac{2}{3}$ to $\frac{3}{4}$ line long. Inflorescence in stronger specimens 17 in. long from the first branch; common axis $8\frac{1}{2}$ in. strong, terete; lowest spike solitary 16 in. (broken at the top) including a stalk of 7 in., the upper sessile, shorter (uppermost 8 in.), separated by decreasing internodes. Rhachis-joints slender becoming clavate at the top, with a line of short stiff upwardly directed points on the outer edge, hollow, plane of separation horizontal, $\frac{3}{4}$ in. long below, decreasing to 4 or 5 lines above. Outer glume of sessile spikelet 3 to $3\frac{1}{2}$ lines long, inner $2\frac{3}{4}$ lines long with a strong sparsely muriculate keel, incurved at the lateral nerves, gl. III. elliptical 2-nerved, $2\frac{1}{2}$ lines long, pale very slightly shorter (I never saw a flower, but as the spikes were getting ripe there may have been a ♂ flower which has perished), fertile glume $2\frac{1}{3}$ lines long, pale slightly shorter. Pedicel of stalked flower free, muriculate like the rhachis-joint, narrowly clavate, $1\frac{3}{4}$ to 2 lines long, spikelet similar and subequal to the sessile, or slightly smaller. A smaller inflorescence (11 in. long) on the second specimen has rhachis-joints 3 lines long, pedicels $1\frac{1}{2}$ line, spikelets $2\frac{1}{2}$ lines, and parts smaller in proportion; occasionally the pedicelled spikelet is reduced in size and sterile.

A very distinct species of the section, nearest *R. latifolia* Steud. in the form of its inflorescence, which however is at once distinguished by its slender rhachis-joints, almost aristate muricate glumes, etc.

Pungo Andongo? No information was found with the plant, which however was in a bundle with others from Pungo. No. **2849.**

3. **R. huillensis** Rendle sp. nov.

Apparently perennial from a hard woody slender rhizome; culm erect from a short ascending base clothed with the strawlike remains of sheaths in the axils of which are leaf-buds; cauline sheaths 2, compressed, the lower subcarinate, striate, margins pilose; ligule membranous, shortly truncate with very shortly fimbriate margin; blades short, narrowly lance-shaped, blunt; racemes few on an elongated axis which they exceed in length, stalked, dense, subcompressed, dull purplish, glabrous; sessile and pedicelled spikelets 1-flowered similar, the latter slightly smaller; the former narrowly bluntly ovate about equal to the rhachis-joint, callus very short, outer glume with a flat incon-

spicuously 3-nerved back and incurved bluntly keeled edges, apex bluntly emarginate, surface minutely scabridulous as is also the exposed surface of the rhachis-joint and pedicel; inner barren glume subequal, chartaceous, bluntly scaphoid with scabridulous keel and incurved edges embracing the third, which is slightly shorter, elliptical, with 2 converging nerves, epaleate, and like the fertile glume hyaline: fertile glume enclosed in the second barren glume, 3-nerved and similar in shape subtending a slightly shorter 2-nerved pale with a ♀ flower; pedicel free, broadly clavate, spikelet narrower and slightly shorter, otherwise similar.

Described from a single specimen: culm to base of inflorescence 14 in., subcompressed, the single exposed node shortly hairy; the sheaths among which it springs show traces of burning. First sheath above the base 3 in. long, slightly shorter than the internode, $1\frac{3}{4}$ lines wide; upper sheath narrower a little over 5 in. long. Leaf-blades stiffish, subflattened with crisped margin, subconspicuously multinerved, with a few hairs at the rounded base, otherwise glabrous, $1\frac{3}{4}$ in. long by scarcely $\frac{1}{4}$ in. wide, or less. Inflorescence $5\frac{1}{2}$ in. long, of 4 curving subcompressed racemes, 3 to 4 in. long, subdigitately arranged on a common axis 2 in. long; rhachis-joints, pedicel, and spikelets glabrous; sessile spikelet 2 lines long, callus very short, scarcely $\frac{1}{4}$ line long; outer glume coriaceous; inner barren glume $1\frac{3}{4}$ line; fertile glume $1\frac{3}{4}$ line, pale $1\frac{1}{2}$ line. Pedicel little over 1 line long, spikelet $1\frac{3}{4}$ line, including like the sessile one ♀ flower.

A very distinct species, perhaps nearest to the Indian *R. speciosa* Hackel, but a smaller plant, distinguished by its smaller blunt 1-flowered spikelets.

Huilla.—In thinly grassed thickets near Mumpulla, rare; Oct. 1859. No. **2648**.

8. **MANISURIS** Sw.; Benth. & Hook. f. Gen. Pl. iii. p. 1130.

1. **M. granularis** Linn. f. Nov. Gram. Gen. p. 37, figs. 4-7 (1779); Hack. Mon. Androp. p. 314; Durand & Schinz, Consp. Fl. Afr. v. p. 700.

*M. polystachya* Beauv. Fl. Owar. p. 24. t. xiv. (1805); *Cenchrus granularis* L. Mant. p. 575 (1771).

Golungo Alto.—Remarkable for its spikes almost entirely enclosed in the sheaths. Sunny places Banza do Sova and Montalegre; Feb. 1855. No. **7259**.

9. **ISCHÆMUM** L.; Benth. & Hook. f. Gen. Pl. iii. p. 1132.

1. **I. fasciculatum** Brongn. Voy. Coqu. Bot. Pt. ii. p. 73 (1829); Hack. Mon. Androp. p. 235; Durand & Schinz, Consp. Fl. Afr. v. p. 697.

Huilla.—In damp rocky mountain places near the cataract of Lopollo; 31 Oct. 1859. No. **7484**.

10. **ANDROPOGON** L.; Benth. & Hook. f. Gen. Pl. iii. p. 1133.

Subgenus I. *Schizachyrium.*

1. **A. brevifolius** Sw. Prodr. p 26 (1788); Hack. Mon. Androp. p. 363; Durand & Schinz, Consp. Fl. Afr. v. p. 707.

Golungo Alto.—A very slender decumbent grass, rendering extremely difficult the ascent of the slopes, on account of its slippery culms. On the sunny slopes of the mountains of Alta Queta, but in few places; May 1855. No. **7250.** On rather high and dry slopes on the eastern side of Monte Queta; end of April 1856. No. **7205.**

Pungo Andongo.—On rocky short-grassed slopes of Pedras de Guinga, but growing sparsely, and intermixed with other grasses; Jan. 1857. No. **7403.**

2. **A. exilis** Hochst. in Flora xxvii. p. 241 (1844); Hack., *l.c.*, p. 365; Durand & Schinz, *l.c.*, p. 711.

Var. **glabrescens** Rendle var. nov.

Pubescent; culms erect 36 to 40 in. long; leaf-blades linear acute 5 to 6 in. long by $1\frac{1}{2}$ lines wide; racemes $1\frac{1}{2}$ to 2 in. long, exserted from the lanceolate acute spathe; rhachis-joints glabrescent, the edges bearing a short white pubescence at the base, 2 to 3 lines long, sessile spikelet and pedicel with aborted spikelet subequal, $\frac{1}{4}$ in. long, pedicel glabrous on back with a line of white hairs on one or both edges; outer glume of sessile spikelet densely pilose on the back; awn of sessile spikelet $\frac{1}{2}$ in., dark brown column and pale yellowish subula equal, awn of stalked spikelet pale, weak, $1\frac{1}{4}$ in. long or less.

Distinguished from var. *Petitianus* Hack. by its less hairy spikelets and somewhat larger coarser racemes.

Pungo Andongo.—In rather damp woods at Mopopo, on the right bank of the river Cuanza; April 1857. No. **7423.**

3. **A. hirtiflorus** Kunth Rev. Gram. p. 569, t. 198 (1829); Hook. f. Fl. Brit. Ind. vii. p. 167 (1896); Hack., *l.c.*, p. 371.

*A. Pseudograya* Steud. Syn. Pl. Gram. p. 365 (1854); Hack., *l.c.*, p. 370; Durand & Schinz, *l.c.*, p. 720. *A. semiberbis* Kunth Enum. i. p. 489 (1833); Hack., *l.c.*, p. 369; Durand & Schinz, *l.c.*, p. 123.

Loanda.—Common in Capimeta near Quicuxe; May 1854. No. **7326.**

Huilla.—In marshy woody places near Catumba, but not yet in flower. The locality was subsequently destroyed by the fires of the Monanensian war. A single specimen in flower Feb. 1860. No. **2650.**

After careful comparison of the American *A. hirtiflorus* and the Asiatic *A. Pseudograya*, I am forced to the same conclusion as that arrived at by Sir Joseph Hooker (*l.c.*), namely, that the two are not specifically distinct. There is, however, considerable variation in the size of the spikelets, especially of the pedicelled, in the thickness of the rhachis-joint, and in the indumentum and colour. The American species can generally be distinguished by the slate-coloured and densely hairy spikes; in Asiatic and African species they are less hairy and generally rufous.

Var. **gracilis** Rendle var. nov.

Spikes very slender, with slender glabrous rhachis-joints.

An erect plant 4 ft. high, culms densely leaved at the stout base, leaf-blades linear, acute, 8 to 10 in. long, 2 to 3 lines broad; spikes $3\frac{1}{2}$ to $4\frac{1}{2}$ in. long, rather lax.

Pungo Andongo? (no information). No. **2869**.

The following number, which is inadequately represented in Herb. Mus. Brit., probably belongs to this species :—

Pungo Andongo.—Thin woods near Calundo; March 1857. No. **7438**.

4. **A. lopollensis** Rendle sp. nov.

Apparently perennial, cæspitose, glabrous excepting the spikes, culms springing from the tufts of leaves, short (9 to 14 in.), flexuose above, bearing short branches which like the main axis end in a solitary pedunculate spike; leaf-sheaths short, compressed, subcarinate, much less than the compressed internode; ligule short, membranous, truncate; blades rigid, linear, folded along the midrib, blunt, of the radical leaves falcate, of the cauline much shorter, and subpatent; spikes ultimately exceeding the narrowly lanceolate reddish spathes, peduncles erect, spikes short with 8 to 9 pairs of reddish heterogamous spikelets and a terminal male spikelet; rhachis-joint shorter than the sessile spikelet, clavate, ending in a short irregular scarious cup, external margin and front bearing long white hairs overtopping the joint; sessile spikelet oblong-lanceolate, blunt, sparsely hairy in the lower half; outer glume with carinate scabridulous margins and flat 4-nerved back, nerves becoming very faint below, apex bidenticulate; gl. II. subequal, linear-oblong, one-nerved, blunt, margin in upper half incurved, hyaline, ciliolate; gl. III. hyaline, suboblong, apex retuse, enerved; fertile glume suboblong, apex shortly bifid, awn weak, imperfect, springing from the notch, equal in length to the glume; pedicelled spikelet ♂, compressed, lanceolate and acuminate, slightly smaller than the sessile, pedicel similar to rhachis-joint; gl. I. with keeled ciliolate margins, back 5-nerved, apex 3-nerved; gl. II. slightly shorter, 3-nerved, lanceolate-oblong, margin as in sessile spikelet; gl. III. broadly suboval from a truncate base, hyaline, blunt, margin ciliolate, inconspicuously 2-nerved; gl. IV. oval, subacute, hyaline, inconspicuously 3-nerved.

Specimen consisting of young shoots springing up after burning. Leaves scabridulous on the exposed lower face, the radical reaching $3\frac{1}{2}$ to 4 in. in length by $1\frac{1}{2}$ line wide; the cauline about as wide, 2 in. long below diminishing to less than $\frac{1}{2}$ in. in the upper part of the culm; sheaths about 1 in. long. Ultimate spathe about 13 lines; spikes $1\frac{1}{4}$ in. Rhachis-joints $1\frac{2}{3}$ line long; sessile spikelet $2\frac{2}{3}$ to nearly 3 lines long; gl. II. subequal to or slightly shorter than gl. I., $2\frac{2}{3}$ to $2\frac{3}{4}$ lines long, membranous, transparent, tinged with red; gl. III. a little over 2 lines long, margins incurved, tinged with red; fertile glume 2 lines, or 4 lines including the awn. Pedicel and ♂

spikelet scarcely 4 lines long; gl. I. $2\frac{1}{3}$ lines long; gl. II. a good 2 lines; gl. III. 2 lines; gl. IV. colourless, $1\frac{1}{2}$ line.

A very distinct species of the section.

Huilla.—Rather damp pastures in the Lopollo district; widely cæspitose; Feb. 1860. No. **2641**.

### Subgenus II. *Diectomis.*

5. **A. fastigiatus** Sw. Prodr. p. 26 (1788); Hack., *l.c.*, p. 393; Durand & Schinz, *l.c.*, p. 711.

Pungo Andongo.—A grass 2 to 3 ft. high, annual, slender, with scarcely cæspitose growth, erect: spikes nodding. In rather damp meadows near Muta-Lucala on the right bank of the Cuanza; Mar. 1857. No. **7405**. In sandy thicket-grown woods between Catete and Luxillo; April 1857. No. **7416**. Lofty meadows of Pedra de Cabindo, on the præsidium; April 1857. With No. **2820** (*Cymbopogon Welwitschii* Var. *minor*).

6. **A. textilis** Welw. ms. in herb.

Widely cæspitose with slender erect culms 2 to 3 ft. high, densely clothed at the base with the withered remains of sheaths; nodes glabrous; leaves glabrous, basal and cauline erect, elongated, very narrowly linear and plicate becoming subulate and finely pointed above; ligule large, ovate, blunt with a strong bicarinate median portion and broad more membranous margins; spikes long-stalked, erect, smaller narrower and more compact than in *A. fastigiatus*; edges of rhachis-joints and pedicels densely hairy, hairs pale ferruginous; sessile spikelet nearly twice as long as the rhachis-joint; outer glume linear-oblong, median portion membranous and densely hairy, margins closely 3-nerved, hispidulous above the middle, the central nerve becoming stronger and passing above on each side into the short hispidulous awn; gl. II. membranous, almost colourless, scaphoid, widest near the middle, the keel minutely hispidulous above, passing into the slender straight awn, completely enclosing the hyaline inner glumes; fertile glume short, bipartite with a strong awn nearly 1 in. long; outer glume of pedicelled spikelet flat, subrigid, purplish brown, obliquely lanceolate, acuminate with shortly ciliate edges and triaristate apex exceeding that of the sessile spikelet by less than one-fourth; gl. II. closely appressed to the outer and reaching to the base of its awns, membranous, lanceolate, shortly aristate with involute edges including gl. IV., which like gl. III. is hyaline and lanceolate with incurved ciliolate edges, and subtends a shorter pale with a ♂ flower.

The bright yellow culms are unbranched below the inflorescence; numerous acaulescent leaf-shoots spring from within the enveloping basal sheaths. The lowest stem internode is enveloped almost to the top by the glabrous striate sheath, the rest are increasingly longer than their sheath. Ligule strong appressed to the stem $\frac{1}{3}$ in. long; blades reaching 14 in. long, about $\frac{1}{3}$ line greatest width (in their natural folded state), upper ones shorter.

Racemes 1 to $1\frac{1}{2}$ in. long, terminal and lateral on long thread-like branches from the uppermost nodes, protruding from their stalked rufous narrowly lanceolate acuminate spathes; rhachis brittle, joints ($1\frac{2}{3}$ line long) with irregularly dentate cup-like apex; sessile spikelet $3\frac{1}{2}$ lines long; callus short with a small tuft of hairs; gl. I. $3\frac{1}{4}$ lines, greenish-red; gl. II. $4\frac{1}{2}$ lines including the awn (2 lines), blunt, widest at or a little above the middle; gl. III. lanceolate, 2-nerved with edges incurved at the nerves, $2\frac{1}{2}$ lines; fertile glume partite to about the middle, 2 lines long, the strong awn springing from between the two acute points, brown and twisted below, kneed below or about the middle and passing into the pale slender flexuose subula; pale short, truncate, scarcely $1\frac{1}{2}$ line; lodicules large fleshy, obliquely cuneate, $\frac{1}{5}$ line long. Pedicel $1\frac{1}{2}$ lines long, apex dentate as in the rhachis-joint, its stiffish hairs reaching $\frac{1}{5}$ way up the outer glume which including the awn is 4 lines long, minutely hispidulous on the back and inconspicuously 9-nerved, the median awn exceeds the two lateral; gl. II. 3 lines long, 5-nerved, reddish; gl. III. $2\frac{1}{2}$ to $2\frac{1}{2}$ lines, 2- to 3-nerved; gl. IV. 2 to $2\frac{1}{2}$ lines, 1- to 3-nerved, pale as in sessile spikelet; anthers reddish, linear, $1\frac{1}{2}$ lines long; lodicules as in sessile spikelet.

An interesting addition to the subgenus which hitherto has contained only the widespread tropical *A. fastigiatus* Sw. From this *A. textilis* is distinguished by its stiffer habit with more rigid leaves, its smaller more compact spikes, the less difference in size between sessile and pedicelled spikelet, and the smaller more rigid outer glume of the latter. Other differences are found in the approach to equality of the outer and inner barren glumes of the stalked spikelets, and the more membranous shorter-awned and more oval inner barren glume of the sessile.

Pungo Andongo.—Widely cæspitose, 2 to 3 ft.; leaves erect, elongated, almost subulate and rushlike, subrigid, used by the inhabitants to make their so-called *Balayas*. Common in rather damp meadows between N-billa and Bumba; Mar. 1857. No. **7440**.

### Subgenus III. *Hypogynium*.

7. **A. ceresiæformis** Nees Fl. Afr. Aust. p. 109 (1841); Hack., *l.c.*, p. 398; Durand & Schinz, *l.c.*, p. 708.

Huilla.—In thicket-grown pastures of Serra de Oahuia in the Humpata district; April 1860. No. **2667**.

8. **A. festucæformis** Rendle sp. nov.

Cæspitose, culms purple, subcompressed, simple below the flowering shoots, springing from a tuft of linear-plicate, rigid, minutely pungent radical leaves; sheaths flattened, carinate, glabrous, ligule short, rounded, blades glabrous except for a few hairs on the inner face at the base; inflorescence strict, the rather short lateral branches bearing several short spikes which ultimately project slightly above their lanceolate reddish spathes; peduncle shorter than the spike, puberulous, apex shortly villous; spike

generally of 6 to 8 pairs of heterogamous spikelets and a terminal male; rhachis-joints shorter than the ♀ spikelets, sparsely puberulous with a short tuft of whitish hairs at the base, plane of union clean, slightly oblique, round; spikelets purplish, subfalcate, narrowly elliptical, the sessile (♀) slightly shorter than the pedicelled (♂); outer glume of sessile with narrowly keeled margin scabridulous above, and flattened membranous enerved back; gl. II. 1-nerved, navicular, acute; gl. III. hyaline, lanceolate blunt, enerved; fertile glume hyaline, linear from a weak stipitiform base, 1-nerved, apex entire; pale absent; lodicules cuneate with crenate apex, almost as long as the glabrous ovary; styles about $\frac{1}{3}$ length of stigmas; pedicel of ♂ spikelets shorter than rhachis-joint, villous with short white hairs; gl. I. subacute with narrowly carinate scabridulous margins, back 1-nerved; gl. II. oval, blunt, 3-nerved, margin inrolled, back round; gl. III. hyaline, 3-nerved, elliptical, blunt, margin ciliolate in the upper half; fertile glume oblong-elliptical 1-nerved.

Plants 2 to $2\frac{1}{2}$ ft. high; radical leaves 10 in. long or less, and $1\frac{1}{2}$ line or less in width, plicate or subconvolute, the solitary cauline leaf shorter often subtending a short filiform flowering branch. Inflorescence about 10 in. long, lower branches $3\frac{1}{2}$ to $4\frac{1}{2}$ in., upper shorter and more crowded. Ultimate spathes $\frac{1}{2}$ to 1 in. long, acute; spikes generally $\frac{2}{3}$ to $\frac{3}{4}$ in.; rhachis-joint 1 line long, narrowly clavate; sessile spikelet acute, 2 lines long; gl. I. $1\frac{3}{4}$ to scarcely 2 lines long, keels scabridulous in the upper two-thirds; gl. II. $1\frac{1}{2}$ line, upper half of keel scabridulous; gl. III. $1\frac{1}{4}$ line, pinkish; fertile glume $1\frac{1}{4}$ line. Pedicelled spikelet $2\frac{1}{2}$ to $2\frac{3}{4}$ lines long, including pedicel; spikelet 2 lines; outer glume with keeled margin, scabridulous in the upper half to two-thirds; gl. II. $1\frac{1}{2}$ to $1\frac{3}{4}$ line; gl. III. $1\frac{1}{2}$ line, pinkish; fertile glume $1\frac{1}{2}$ line, colourless; anthers $\frac{2}{3}$ line.

Most nearly allied to the American *A. spathiflorus* Kunth, but easily distinguished by its longer narrow raceme, and larger spikelets.

Huilla.—A grass 2 to $2\frac{1}{2}$ ft., cæspitose, erect, rose-violet, with habit of a Fescue; spikes dull-purple, rather strict. Plentiful in boggy and spongy places near the streams in the Humpata district; Dec. 1859. No. **7505.**

Subgenus IV. *Arthrolophis.*

9. **A. eucomus** Nees, *l.c.*, p. 104; Hack., *l.c.*, p. 421; Durand & Schinz, *l.c.*, p. 711.

Pungo Andongo.—Growing sparsely (or perhaps already over) in rather dry meadows near Bumba, not far from Condo; a unique specimen; March 1857. No. **7442.**

10. **A. huillensis** Rendle sp. nov.

Perennial, apparently cæspitose; culms geniculate rising from a basal leafy tuft, lower internodes long, stout, subterete, like the upper considerably exceeding the sheaths, nodes glabrous, long slender flowering branches spring from the third and higher nodes;

ligule short, membranous, truncate, shortly hairy; blade linear, flat or plicate along the prominent midrib, or subinvolute, glabrous, sparsely hairy on the upper face at the base and on the adjoining mouth of the sheath; inflorescence with glabrous peduncle exceeding the long narrow shortly acute sheath, false racemes generally 5, comprising two shortly stalked outer pairs and a simple central raceme, slender, weak; rhachis-joint slightly shorter than the ♀ spikelet, slender, curved, densely villous, hairs whitish, far exceeding the joint; sessile spikelet glabrous, lanceolate, outer glume 2-nerved, apex bidenticulate, back concave, margins involute below becoming carinate and scabridulous above the middle; gl. II. subequal, one-nerved, navicular, shortly mucronate, margins becoming hyaline and ciliolate; gl. III. oblong-lanceolate, blunt, hyaline, enerved, edges incurved and ciliolate above; fertile glume oblong, hyaline, shortly bifid, with a weak apical awn, column only slightly exceeding the spikelet; pale less than half the length of the glume, blunt; pedicel of aborted spikelets subequal to rhachis-joint but narrower, similarly hairy, spikelet bluish represented only by the linear-lanceolate acuminate outer glume.

Culms 3 ft. 6 in. high, internode next or next but one above the base 6 in. long, 1 to $1\frac{1}{2}$ line in diameter; cauline leaves nearly 5 in. or less, $1\frac{1}{2}$ lines wide or less, becoming narrower upwards; ligule less than $\frac{1}{2}$ line long; ultimate spathes $3\frac{1}{2}$ in. long; top of peduncle glabrous or minutely and sparsely pilose; inflorescence subfastigiately spreading $2\frac{1}{2}$ to 3 in. long; common peduncle of lateral pairs of racemes 2 to 3 lines long, pedicel of stalked branch a little shorter; rhachis-joint a good 2 lines long; sessile spikelet $2\frac{1}{2}$ lines or a trifle less; outer glume bluish, keel of gl. II. scabridulous in the upper half; gl. III. scarcely 2 lines long; fertile glume $1\frac{1}{2}$ line long, awn $\frac{1}{2}$ in. flexuose, scabridulous, pale $\frac{1}{2}$ line long, lodicules narrowly cuneate $\frac{1}{4}$ line, anthers (3) linear, $\frac{4}{5}$ line long; ovary glabrous, styles slightly shorter than the stigmas; pedicelled spikelet 1 to $1\frac{1}{5}$ line long, glume 1-nerved with margins carinulate and scabridulous except in lower third.

Near *A. eucomus* Nees, but distinguished by its larger spikelets, constant presence of the aborted ♂ spikelet, laxer false racemes, etc.

Huilla.—Rather poor wooded meadows at Humpata; April 1860. No. **2670**.

Var. **minor** Rendle var. nov.

Culm 16 to 20 in., racemes in twos or threes, resembling somewhat those of *A. ternatus* var. *africanus*, $1\frac{1}{2}$ to 2 in. long; rhachis-joints and spikelets slightly shorter than in the species, sessile spikelets $1\frac{4}{5}$ to $2\frac{1}{4}$ lines, slightly exceeding the rhachis-joint.

Huilla.—Rather damp rich pastures on the river Monino; Jan. 1860. No. **2644**.

11. **A. ternatus** Nees Agrost. Bras. p. 326 (1829); Hack., *l.c.*, p. 424.

Var. **africanus** Rendle var. nov.

Densely cæspitose; culms 6 to 12 in., unbranched, glabrous,

sheaths and leaves glabrous, blades short, linear, plicate, subacute; racemes 2 to 3, $1\frac{1}{2}$ to $1\frac{3}{4}$ in. long, densely hairy, hairs pale-fulvous twice as long as the rhachis-joints, sessile spikelets exceeding the rhachis-joints, nearly three lines long, callus of gl. I. with a tuft of very short hairs; gl. II. rather narrowly navicular, acuminate with a short awn scarcely $\frac{1}{2}$ line long; fertile glume hyaline, base stipitiform, bifid for more than $\frac{1}{3}$ of its length, awn 8 to 10 lines long; pedicel of aborted ♂ spikelet 2 lines long, spikelet consisting only of the outermost glume, lanceolate, acuminate, aristulate, scarcely $2\frac{1}{2}$ lines long including the awn which is almost equal to the rest of the glume.

Huilla.—Rather dry wooded pastures near Humpata; April 1860. No. **2643**.

12. **A. gayanus** Kunth Rev. Gram. p. 163 (1829) (nomen), Enum. Pl. i. p. 491 (1833); Benth. in Hook. Niger Fl. p. 572 (1849); Hack., *l.c.*, p. 447; Durand & Schinz, *l.c.*, p. 713.

Loanda.—An elegant grass, annual, 3 to 6 ft., erect. In grassy places at Waianga d' El Rei; May 1858. No **7285**. No. **7368***c* (?) material inadequate for certain determination.

Golungo Alto.—A tall grass, 5 to 9 ft., and even in damp places, higher. In uncultivated places by roads and the edges of fields; beginning of July 1855. No. **7249**.

Pungo Andongo.—In low-lying meadows in the præsidium along with species of *Gladiolus*, but not common; end of April 1857. No. **7402**.

Cazengo.—A grass 5 to 8 ft. high with somewhat nodding panicles. Among herbage on edges of thickets near Dalatanda; June 1855. No. **2951**.

13. **A. schirensis** Hochst. ex A. Rich. Tent. Fl. Abyss. ii. p. 456 (1851); Hack., *l.c.*, p. 452; Durand & Schinz, *l.c.*, p. 722.

Pungo Andongo.—Cæspitose in rather damp meadows between N-billa and Bumba on the right of the river Cuanza; March 1857. No. **7439**.

14. **A. diversifolius** Rendle sp. nov.

Apparently perennial by means of a hard slender rhizome; culms slender, innovation shoots extravaginal; culms erect, terete, laxly branching, nodes glabrous; sheaths rounded, glabrous, shorter than internodes; ligule very short; lower leaves flat, linear from a tapering base, apex tapering, acute, upper ones, especially on the flowering shoot, sometimes narrowly lanceolate, generally tapering gradually from a broadly cordate amplexicaul base to an acute apex, rigidulous, glabrous or with a few hairs on the upper surface at the base, margin scabridulous; racemes in pairs, terminating the main axis and the few long slender branches, far exceeding the non-spathiform uppermost sheath; one raceme shortly pedicelled, with spikelets all heterogamous (5 ♀ pairs), the other sessile with a homogamous basal pair and 2 heterogamous; rhachis-joints and pedicels flattened with shortly villous margin (hairs white below becoming fulvous above), passing above into an oblique scarious cup; sessile

spikelets narrowly lanceolate-oval, glabrous except for a tuft of short white hairs at the base of the acute callus, callus medianly furrowed, outer glume linear-oblong with a strong median furrow for $\frac{2}{3}$ of its length from the base, coriaceous becoming scarious at the apex, margin incurved membranaceous, slightly exceeding gl. II. which is narrowly navicular, subacute with keel hispidulous on the upper half; gl. III. shorter, hyaline, linear-oblong, blunt; fertile glume linear-oblong, deeply bipartite, with a strong kneed awn springing from the notch, column deep-brown shortly hairy, subula pale, scabridulous; stalked spikelet exceeding the sessile, dorsally flattened, lanceolate, outer glume with hispidulous carinate margins, midrib conspicuous with 5 less conspicuous nerves on each side, apex triaristulate; gl. II. shorter, narrowly oval, 5-nerved with incurved hyaline ciliate margins; gl. III. and IV. shorter, equal.

About 3 ft. high, culms not exceeding 1 line in diameter; leaf-sheaths 1 to $1\frac{2}{5}$ in. long, ligule reduced to a scarious ridge less than $\frac{1}{4}$ line long; lowermost (linear) leaves to 6 in. long by $1\frac{1}{2}$ line wide, upper (with cordate base) 2 to 4 in. long, 3 to 6 lines broad at the base. Racemes $1\frac{1}{2}$ in. and 1 in. respectively, not including awns, approximate, rhachis-joint $3\frac{1}{3}$ lines, including the glabrous cup ($1\frac{1}{3}$ line); sessile spikelet 4 to $4\frac{1}{2}$ lines, including the callus (1 line); gl. I. 4-nerved, greenish becoming reddish at the apex; gl. II. $3\frac{1}{2}$ lines long, subcoriaceous, glabrous; gl. III. $2\frac{3}{4}$ lines, faintly 2-nerved with margins incurved; fertile glume $2\frac{3}{4}$ lines, awn 2 in. column slightly exceeding subula. Pedicelled spikelet 8 lines, outer glume 5 to 6 lines long, median aristula 1 to 2 lines, lateral ones very short; gl. II. $4\frac{1}{2}$ lines long; gls. III. and IV. $3\frac{1}{3}$ lines, the former 3-nerved lanceolate, subhyaline, the latter hyaline, narrow, 1-nerved.

Near the South African *A. amplectens* Nees, but differs in the marked broadly cordate-based leaves, especially on the stronger (flowering) shoot, the shorter few-flowered racemes, and the longer and stronger awns of the sessile spikelets.

Pungo Andongo.—In rocky wooded places between Caghui and Candumba; March 1857. No. **2835**.

Subgenus V. *Amphilophis*.

15. **A. Ischæmum** L. Sp. Pl. p. 1047 (1753).

Var. δ. **lævifolius** Hack., *l.c.*, p. 476; Durand & Schinz, *l.c.*, p. 715.

Loanda.—1853-4. No. **7375**, **7348**.

16. **A. intermedius** R. Br. Prodr. p. 202 (1810).

Var. **punctatus** subvar. **glaber** Hack., *l.c.*, p. 487; Durand & Schinz, *l.c.*, p. 715; but closely resembles Robert Brown's type.

Golungo Alto? No. **2964** (no information).

The following number, represented by a fragment insufficient for determination, probably belongs to this subgenus.

Pungo Andongo.—Quibinda, in a lake; end of March 1857. No. **7398**.

SUBGENUS VI. *Dicanthium*.

**17. A. annulatus** Forsk. var. **papillosus** Hook. f. Fl. Brit. Ind. vii. p. 197 (1896).

*A. papillosus* Hochst. ex A. Rich., *l.c.*, p. 457; Hack., *l.c.*, p. 573; Durand & Schinz, *l.c.*, p. 719.

LOANDA.—A tall erect grass 3 to 4½ ft., with branched culms and *Andropogon*-like habit. Very common on sandy rather damp plains and stretches of *Fimbristylis* between Os dois Imbondeiros and Quicuxe; 6 and 7 Feb. 1859. No. **2912**. A grass 3 ft. high with European habit, growing in rather damp places from Quicuxe towards Cacuaco, but not common; June 1858. No. **7315**. No. **7323** (no notes).

MOSSAMEDES.—3 to nearly 4 ft., branched from the base, culms erect-ascending branched, spikes dull purple. In thickets on gneiss cliffs on the banks of the Bero; July 1859. No. **2609**.

**18. A. piptatherus** Hack. in Mart. Fl. Bras. ii. 3. p. 293 (1883).

Var. **genuinus** Hack. Mon. Androp. p. 580; Durand & Schinz, *l.c.*, p. 720.

GOLUNGO ALTO? No. **7244** (no information).

11. **SORGHUM** Pers.; Benth. & Hook. f. Gen. Pl. iii. p. 1135.

**1. S. halepense** Pers. Synop. i. p. 101 (1805).

*Andropogon Sorghum* subsp. *halepensis* Hack. Mon. Androp. p. 501.

Var. **halepense** subvar. **muticum** Hack., *l.c.*, p. 502.

MADEIRA.—Funchal on the road towards Camera dos Lobos; Aug. 1853. No. **2917**.

Var. **effusum** subvar. **aristatum** Hack., *l.c.*, p. 503.

AMBRIZ.—Nov. 1853. No. **2898**.

CAZENGO.—A grass 4 to 7 ft., with the habit of *Holcus* or *Avena*, and a huge nodding panicle. Common in once cultivated places almost everywhere in the districts of Cazengo and Golungo Alto. Caculo; June 1855. No. **2994**.

ICOLO E BENGO.—In rather damp places inundated in summer on the left of the river Bengo; Sept. 1856. No. **7197**. Banks of river Bengo between Quifandongo and Funda; Sept. 1854. COLL. CARP. 1108.

LOANDA.—A grass 4 to 12 ft. high, annual or more rarely in damp places biennial, culm erect, branched from the middle, and like the leaves spotted with a deep blood-red colour. Found growing sporadically in damp places once cultivated near Imbondeiro dos Lobos; June 1858. No. **7277**. Called Massambala by the blacks. No. **7331** (no notes).

Subvar. **submuticum** Hack., *l.c.*, p. 503.

AMBRIZ.—Nov 1853. No. **2898***b*.

**2. S. vulgare** Pers., *l.c.*

*Andropogon Sorghum* Brot. Fl. Lusit. i. p. 88 (1804); *A. Sorghum* subsp. *sativus* Hack., *l.c.*, p. 505.

Var. **saccharatum** Koern. in Koern. & Wern. Handb. Getreid. i. p. 310 pro parte vel aff.; Hack., *l.c.*, p. 509; Durand & Schinz, *l.c.*, p. 725; Masambala rubro Welw. Syn. Explic. p. 35 (1862).

Young panicle narrowly elliptical and dense, 5 by 1½ in., the lowest branches about 1 in. long; base of the main rhachis and insertion of its branches villous, edges of branches scabrid. Outer

glume of sessile spikelet elliptical-ovate to ovate obtuse, about 3 lines long by $1\frac{1}{4}$ line broad, upper $\frac{1}{4}$ to $\frac{1}{5}$ chartaceous with greenish nerves, flattened, sparsely pilosulose especially in the upper half, depressed or not beneath the apex. Glumes almost glabrous and polished when mature, gaping widely to expose the reddish subglobular caryopsis with flattened hilum. Awn projecting about 2 lines, including knee, from the spikelet. Sheaths and leaves tinged with blood-red.

HUILLA.—*Sorghum* red-seeded variety (Masambala rubro). Cultivated promiscuously with the white-seeded variety and very common in all the country of Huilla; Feb. and May 1860. No. **2681**.

Panicle small, lanceolate, rhachis and branches sparsely villous to glabrous; sessile spikelets broadly elliptical to ovate, $2\frac{1}{4}$ to $2\frac{1}{2}$ by $1\frac{1}{4}$ to $1\frac{1}{2}$ lines; pedicelled spikelet slightly shorter, blunt, unawned; outer glume shining coriaceous, becoming more or less chartaceous greenish and nerved in the upper $\frac{1}{3}$, sparsely hairy, not depressed below the blunt apex.

PRINCE'S ISLAND.—In gravel near Porto de S. Antonio; Sept. 1853. No. **2932**.

Var. **ovuliferum** Hack., *l.c.*, p. 510; Durand & Schinz, *l.c.*, p. 725. Masambala bianco Welw., *l.c.*

HUILLA.—Nearly always 5 to 6, sometimes 7 to 9 ft. high, narrowly erect, very beautiful and very productive. Very commonly cultivated in all the country of Huilla, where it is called Masamballa (bianco); April 1860. No. **2682**.

Var. **obovatum** subvar. **nigrum** Hack, *l.c.*, p. 514.

Very near var. *saccharatum* but glumes becoming a deep black when ripe, caryopsis reddish-brown.

LOANDA.—*Sorghum saccharatum?* Cultivated round Mossamedes, where it was introduced in 1856. National garden; Dec. 1859. No. **2882**.

MOSSAMEDES.—*Sorghum saccharatum* cultivated at Lisbon from seeds picked at Mossamedes; taken in young and mature fruit; July 1863. No. **2881**.

HUILLA.—*Sorghum saccharatum* cultivated in Lopollo in this year for the first time from seeds from Lisbon, but almost entirely destroyed in the Monanensian war. Colonel Kneisman's garden; May 1860. No. **2682***b*.

Var. **angolense** Rendle var. nov.

Panicle rather dense, elliptical-oblong or lanceolate, 5 to $6\frac{1}{2}$ in. long by $1\frac{1}{2}$ to $2\frac{1}{2}$ broad; branches erecto-patent, lowermost 1 to 2 in.; rhachis more or less villous especially at branch-origins; sessile spikelet ovate to elliptical-ovate or elliptical, $1\frac{3}{4}$ to 2 lines long by 1 or scarcely 1 broad, pedicelled about $\frac{1}{2}$ to $\frac{1}{3}$ length of sessile; sessile generally awned, awn bent horizontally at the point of emergence and protruding $1\frac{1}{2}$ to 2 lines. Outer glume coriaceous smooth and shiny to within $\frac{1}{3}$ to $\frac{1}{4}$ of the apex where it is greenish, chartaceous, inconspicuously nerved and like the edges sparsely hairy; apex blunt; subapical depression often present.

Differs from var. *saccharatum* in its smaller more shortly awned or awnless spikelets, and denser panicle.

This variety seems to be widely spread in tropical America under the name African corn or Guinea corn.

GOLUNGO ALTO.—8 to 12 ft. high, branched at the top, branches and main axis blood-red at the base. Cultivated by the river Cuango in Arimo do Isidro; end of Sept. 1855. No. **7237**. Native name Massambalo.

CAZENGO.—A gigantic grass, 10 to 15 ft. or more, culm straight and simple below, fasciculately branched above; leaves generally with blood-red spots, like the culm and branches. Grows spontaneously in places formerly cultivated, and round the negro villages, and is everywhere cultivated. On low hills by the river Luinha; June 1855. No. **7216**. Native name Massambâla, Massa-M-bala.

GOLUNGO ALTO.—Sange, Quintal do Joaq. Velho. Cultivated nearly everywhere; Jan. 1855. No. **2995**.

The specimen consists only of a single leaf and a small piece of the panicle, with small shortly acute or blunt ovate unawned sessile spikelets, scarcely 2 lines long.

ST. JACOB'S ISLAND, CAPE VERDE ISLANDS.—Semispontaneous in abandoned fields; Jan. 1861. No. **2880**.

3. **S. nutans** Gray, Man. Bot. N. Unit. Stat. [ed. 2], p. 584.
*Andropogon nutans* L. Sp. Pl. p. 1045 (1753); Hack., *l.c.*, p. 528.

This species, hitherto unrecorded from the Old World, is represented by two very distinct varieties.

Var. **angolense** Rendle var nov.

Panicle elongated, lax, flexuose, branchlets capillary, 1- to 4-flowered; spikelets submembranous, 3 lines long, awn pale, weak, subimperfect (showing no marked differentiation into column and subula), projecting 2 to 3 lines; outer glume lanceolate, narrowly truncate, pilose especially in the lower half, hairs white or faintly tinged with purple, callus with a tuft of similar hairs, 7- to 9-nerved; gl. II. glabrous except the pilosulose margins, 5-nerved; leaf-sheaths glabrous, blades linear, subscabridulous on upper surface, 2 lines broad or less, upper ones convolute; ligule truncate, $\frac{1}{2}$ to $\frac{3}{4}$ line long.

Near Hackel's wide-spread American var. *avenaceum* but distinguished by its more membranous shortly awned spikelets, lax panicle, etc.

HUILLA.—Rather damp wooded meadows between Lopollo and Catumba; Feb. 1860. No. **7491**. Damp wooded grassy places near Catumba; April 1860. No. **7496**.

Var. **incompletum** Hack., *l.c.*, p. 531.

The plants are larger, with spikelets a shade larger (2 to $2\frac{1}{2}$ lines), and awns a trifle longer ($1\frac{1}{2}$ in.) than in the Mexican plants, to which hitherto this variety has been confined, but otherwise similar and certainly inseparable varietally.

PUNGO ANDONGO.—An annual cæspitose grass, slender, with coarctate panicles, tawny gold and brightly shining when alive. Common in sandy woods near Quilanga; middle of April 1857. No. **2821**.

12. **ANATHERUM** Beauv. Agrost. p. 128, t. 22, fig. x. (1812).
*Vetiveria* Thou. ex Virey in Journ. Pharm. ser. 1. xiii. p. 499

(1827). *Andropogon* L., Benth. & Hook. f. Gen. Pl. iii. p. 1133, pro parte.

1. **A. muricatum** Beauv., *l.c.*, p. 150.

*Andropogon squarrosus* Linn. f., var. *nigritanus* Hack. Mon. Androp. p. 544; Durand & Schinz, Consp. Fl. Afr. v. p. 727; *A. nigritanus* Benth. in Hook. Niger Fl. p. 573 (1849).

Pungo Andongo.—Woody marshy places near Sansamanda; Feb. 1857. No. **2780**. A tall perennial grass, 6 to 8 ft., with rigid erecto-patulous distichously sheathing leaves, and except for the culm, looking almost like a species of *Typha*; panicles thyrsiform a foot long, spikes whorled, spikelets violet-purple. Round about marshes between the rivers Lombe and Cuije, but not common; March 1857. No. **2817**. No. **2867***b* (no notes).

13. **HETEROPOGON** Pers.; Benth. & Hook. f. Gen. Pl. iii. p. 1133.

1. **H. hirtus** Pers. Synops. ii. p. 533 (1807).

*H. contortus* Beauv. ex Roem. & Schult. Syst. ii. p. 836 (1817). *A. contortus* L. Sp. Pl. p. 1045 (1753); Hack. Mon. Androp. p. 585; Durand & Schinz, Consp. Fl. Afr. v. p. 709.

Loanda.—By dried-up streams above Boa Vista; March 1854. No. **7359**. No. **7359***b* (no notes). 1853-4, Nos. **7368**, **7368***b*.

Golungo Alto.—Nos. **2950**, **2972** (no notes).

Pungo Andongo.—Spikes white-bearded. Rather dry pastures near Luxillo; Dec. 1856. No. **2743**. Damp meadows near Sansamanda; Feb. 1857. No. **2784**. Wooded meadows near Sansamanda; Feb. 1857. No. **2786**. Mountain meadows of the præsidium; Feb. 1857. No. **2783**. A widely and closely cæspitose grass, very rarely well-developed on account of the plentiful disease of the spikelets. In thicket-grown meadows near Pedras de Guinga; March 1857. No. **2806**.

These last two numbers have the spikes much eaten and distorted by a fungus, which Miss Smith has determined as *Ustilago Cesatii* Fisch. de Waldh.

The numbers included show considerable variation in the hairiness of the outer glume of the male spikelet, and would fall under subvars. *typicus* and *hispidissimus* of Hackel (*l.c.*, pp. 586, 587); but I agree with Sir J. D. Hooker (Fl. Brit. Ind. vii. p. 200) that the character is too inconstant for such definition of subvarieties.

Var. **glaber** Hack., *l.c.*, p. 587.

Huilla.—Thicket-grown hills near Lopollo, but only in one locality, where it is fairly common; May 1860. No. **7515**.

2. **H. acuminatus** Trin. in Mém. Ac. Petersb. ser. 6. ii. p. 254 (1832).

*Andropogon melanocarpus* Elliott, Sketch Bot. S. Carol. i. p. 146 (1821); Hack., *l.c.*, p. 584; Durand & Schinz, *l.c.*, p. 717.

Pungo Andongo.—A grass 2 to 3 ft., with habit somewhat foreign to the genus; wrinkles on outer pales remarkable, almost locellate. Sandy woods on right of river Cuanza between Mopôpo and Sansamanda; April 1857. No. **7388**.

3. **H. grandiflorus**.

*Andropogon grandiflorus* Hack. in Flora lxviii. p. 127 (1885), Mon. Androp. p. 648; Durand & Schinz, *l.c.*, p. 713.

The following supplements Hackel's description :—Ligule membranous, truncate, entire, glabrous, reaching 1 line in length on the lower leaves; leaf-blades narrowly convolute tapering to a pungent apex, glabrous, under exposed face conspicuously veined, reaching $8\frac{1}{2}$ in. in length, becoming shorter upwards.

Pungo Andongo.—Sandy places on the banks of the river Cuanza; Feb. 1857. No. **2777**.

14. **CYMBOPOGON** Spr. Pl. Min. Cogn. Pug. ii. p. 14 (1815).
*Andropogon* L.; Benth. & Hook. f. Gen. Pl. iii. p. 1133 pro parte.

1. **C. schœnanthus** Spr., *l.c.*, p. 15.
*Andropogon schœnanthus* L. Sp. Pl. p. 1046 (1753); Hack. Mon. Androp. p. 609; Durand & Schinz, Consp. Fl. Afr. v. p. 722.

Var. **densiflorus**.

Subsp. *densiflorus* Hack., *l.c.*, p. 611, extended, the specimens having larger racemes and spikelets, ultimate spathes 7 to 8 lines long, racemes $5\frac{1}{2}$ to 7 lines long, spikelets 2 lines, but otherwise conforming to the description.

Golungo Alto.—A fine grass, the whole tinged with a very glaucous red colour, a very celebrated remedy among the Golungo physicians. Root pleasantly aromatic. Rather rare near Sange; not yet in full flower, June 1855. Differs abundantly from all the rest of the genus seen in tropical Africa by the glaucous colour of the stem and leaves. Native name Saca. On right of river Cuango; Aug. 1855. No. **3006**. Nos. **7238**, **2952**. Sáco, species of *Andropogon* used by the natives as a tonic for headache (see Welw. Apont., p. 541), and also a favourite antidote against Stramony poisoning; June 1856. Coll. Carp. 1092.

Pungo Andongo.—A perennial grass 5 to 8 ft. high, with erect branched culm, and raceme-like nodding-patulous panicles. Leaves and root pleasantly aromatic smelling almost like citron. On rather high hills on the banks of the river Cuanza; 4 March 1857. No. **2725**. 5 to 7 ft. high, erect, rather fine-looking, with a creeping rhizome. In grassy thickets between Candumba and Mangue; March 1857. No. **7428**.

Var. **stypticus** var. nov.

*A. stypticus* Welw. Syn. Explic. p. 27 (1862).

Leaf-blades linear-tapering with setaceous apex, 10 to 12 in. long, $\frac{1}{4}$ to little over $\frac{1}{2}$ in. broad, glabrous, glaucous, base cordate; ligule broadly ovate from a truncate base, membranous, 2 to 3 lines long; inflorescence elongated 15 in. long, nodding, consisting of several dense suboval axillary panicles passing above into a dense subsecund falcate terminal panicle; ultimate spathes $\frac{1}{2}$ to $\frac{2}{3}$ in. long, racemes 5 to 7 lines; sessile spikelets oblong-lanceolate $1\frac{3}{4}$ to 2 lines long, outer glume enerved, median furrow extending from the base to about the middle; gl. IV. narrowly linear, $1\frac{1}{4}$ line long, shortly bifid with a weak imperfect awn 2 to $2\frac{1}{2}$ lines long springing from the incision; pedicelled spikelet $1\frac{1}{4}$ to $1\frac{1}{2}$ lines long (2 lines with pedicel), neuter, outer glume oblong-lanceolate, 3-nerved, inner glume small, hyaline, other glumes unrepresented.

Huilla.—Very common in meadows and thickets throughout the whole country of Huilla, especially between Lopollo and Nene and

then on the way to Mumpulla ; Aug. and Oct. 1859 and June 1860 ; in fr. Feb. and April 1860. Called by the blacks of Huilla N-cotahóte and used as a remedy for bleeding from the nose by Riamba- (hemp) smokers ; also for acute hæmorrhage. No. **7526**. *A. stypticus* Welw. Common in fields about Humpata, Mumpulla ; June 1860. Coll. Carp. 1093. "Encotahote (aromatic shrub) exhibitio Dr. Frederico Welwitsch. No. **1321**. Sect. 1st, 2nd class." Coll. Carp. 1094.

2. **C. Nardus.**

*Andropogon Nardus* L., *l.c.* ; Hack., *l.c.*, p. 601 ; Durand & Schinz, *l.c.*, p. 718.

Loanda.—*A. Schœnanthus?* Lemon grass of the English. A widely and closely cæspitose grass, perennial (?), rhizome and leaves with a pleasant aromatic smell when rubbed, almost like that of lemon. Very rarely cultivated in Loanda, where it was introduced from the country of Serra Leôa ; never seen in flower. Casa do Sr. Gabriel ; Feb. 1854, leaves only. No. **7288**.

Mossamedes.—Cf. *A. Schœnanthus* L. Brought from Mozambique in 1855 by Dr. Sales, and now commonly cultivated round Mossamedes, affording excellent fodder for cattle, Aug. 1859 ; in cotton plantations on banks of river Bero (probably introduced?), beginning of July 1859 ; no flowers. No. **2284**.

3. **C. rufus.**

*Andropogon rufus* Kunth Enum. i. p. 492 (1833).

Var. **genuinus** Hack., *l.c.*, p. 621 ; Durand & Schinz, *l.c.*, p. 721.

Golungo Alto.—Called by the negroes Mosseque and used everywhere for thatching houses. The blacks of Queta call the same thing Mosoque. Common in reedy places throughout the whole district. Sange ; beginning of June 1855. No. **2954**. A grass 4 to 6 sometimes 7 ft. high, slender, with linear suberect dull purple spikes. Specimens flowering later than usual. In sunny thicket-grown places along with other species of the same genus to the right of the river Cuanga ; end of Sept. 1855. No. **7224**. In once cultivated places near Sange ; Arimo do Mariano ; beginning of July 1855. No. **7246**. Gardens at Sange ; July 1855. No. **7264**. No. **2948***c* (no notes).

Icolo e Bengo.—Tall grassy places on banks of river Bengo. Almost past flowering ; Sept. 1854. No. **7195**. Common in grassy places, flooded in summer, near the banks of the river Bengo near Funda and Quifandongo ; Sept. 1854. No. **7196**.

Var. **fulvicomus** Hack., *l.c.*, p. 621.

Huilla.—In grassy wooded places, Lopollo ; April 1860. No. **7511**.

Var. **major** Rendle var. nov.

Peduncle minutely scabridulous not villous above, hairs on rhachis and short tuft on callus of sessile spikelet white, on peduncle whitish below becoming tawny above ; sessile spikelet $2\frac{1}{2}$ lines, outer glume truncate, purplish, sparsely pilose, hairs tawny, awn strong, $1\frac{1}{4}$ in. long ; pedicelled spikelet acute, more hairy than the sessile, 3 lines long ; racemes 1 to $1\frac{1}{5}$ in. long.

Pungo Andongo.—Common in sandy wooded places. Islands of Calemba ; March 1857. No. **7409**.

4. **C. Schimperi.**

*Andropogon Schimperi* Hochst. in Flora xxiv. Intell. i. p. 20

(1841) (nomen); A. Rich. Tent. Fl. Abyss. ii. p. 466 (1851); Hack., *l.c.*, p. 623; Durand & Schinz, *l.c.*, p. 721.

Cazengo.—Plentiful in rather damp reed-grown places near Dalatando; June 1855. No. **2947**.

Golungo Alto.—5 to 8 ft. high, growing socially, often deceiving with its various habit; culm at first erect, then ascending and rooting. In reedy places throughout the whole district, especially by roadsides and margins of fields; beginning of July 1855. No. **2953**. A fine grass, 4 to 7 ft. high, with culm $\frac{1}{4}$ to $\frac{1}{3}$ in. thick at the base; adult leaves spreading horizontally, soon deflexed. Small specimens long past flowering; the proper time of flowering is May and June. Confines of woods near Cacarambola in the Sange district; Sept. 1855. No. **7219**. Plentiful in reedy places near Cambondo; beginning of July 1855. No. **7247**. No. **2948** (no information).

5. **C. Phoenix** Rendle sp. nov.

Perennial by a stout strong horizontal rhizome, widely cæspitose, stems sturdy in the lower part, closely enveloped by the large, long, loose, somewhat sparsely hairy leaf-sheaths, or in the shoots which have shot forth after the forest fires, with a much shorter and not strongly developed lowest internode and sheath; upper sheath cylindrical, closely enveloping and about $\frac{2}{3}$ to $\frac{3}{4}$ the length of the slender terete internode, glabrous except at the pilose mouth; ligule conspicuous, red-brown, membranous; blade long, linear-tapering, in the stronger leaves very narrowly linear-lanceolate, with an acuminate awnlike tip, rigidulous, subscabridulous; panicle lax, effuse, about 6 in. long, branches long, slender, drooping, three or four together, bearing 1 to 4 lanceolate acuminate purplish spathes, pedicels $\frac{1}{3}$ to $\frac{1}{2}$ as long as the spathe, racemes subsessile, stalks epinastic, each with 2 basal pairs of homogamous spikelets and 2 to 3 ♀; homogamous spikelets linear-falcate to lanceolate-acute, reddish, ♂, glabrous, rhachis-joints and pedicels with white villous margins; ♀ spikelets exceeding the rhachis-joint, oval to oval-oblong, gl. I. ovate, 9-nerved, margins involute, carinate and scabridulous in the upper third; gl. II. subequal, 3-nerved, broadly scaphoid, margins incurved at the lateral nerves, median nerve carinate and scabridulous in the upper half; gl. III. shorter, hyaline, 2-nerved; gl. IV. shorter, slender, hyaline, awn brown flexuose, $1\frac{3}{4}$ in. long; gl. I. of pedicelled spikelet flattened, lanceolate-acute, reddish, glabrous, 7-nerved, apex aristate; gl. II. oval-oblong, 3-nerved; gl. III. shorter, hyaline, with an aborted ♂ flower at the base, or no trace of a flower; gl. IV. absent.

Plants $1\frac{1}{2}$ to 2 ft. high; basal sheaths in the strongly-grown specimen (No. 7193) 9 in. long, in the rest (No. 7226) not exceeding 3 in.; upper sheaths 4 to 2 in. long; leaf-blades reaching 15 in. (or perhaps more) in length, by 2 to 5 lines broad. Ultimate spathes $1\frac{1}{4}$ to nearly 2 in. long; racemes 7 to 11 lines long, stalks pulviniform, shortly villous inside, the longer reaching 1 line; homogamous spikelets 3 to 4 lines, with glabrous back and margins carinate in the upper half, and scabridulous like the apex, rhachis-hairs shorter than the joint, which is a little over 1 line, inser-

tion oblique; ♀ spikelet $3\frac{1}{2}$ to $3\frac{1}{2}$ lines long, including the callus (scarcely $\frac{2}{3}$ line); gl. I. $2\frac{1}{2}$ line, the truncate apex crimson and scarious, and the upper half more or less tinged with red, sparsely puberulous on the back; gl. II. ovate and truncate when flattened, membranous, transparent, tinged with red in the upper half; gl. III. $2\frac{1}{2}$ line; gl. IV. $1\frac{2}{3}$ line; pedicel of stalked spikelet $1\frac{1}{3}$ to $1\frac{2}{3}$ line, gl. I. $3\frac{1}{4}$ to nearly 4 lines long, back glabrous, slightly scaberulous upwards, margin inflexed, carinate and scabrid in the upper third, embracing the flattened hyaline inflexed gl. II. ($2\frac{1}{2}$ lines long).

Near *C. diplandrus*, but distinguished by its longer, darker-coloured, purplish racemes, the long-acute, barren, pedicelled spikelets, and the longer-awned ♀ spikelets.

Golungo Alto.—Native name Mosoque, *i.e.* Mosake. Sparsely thicket-grown slopes, in sandy-clayey soil in the mountains of Sobato de Bumba; Oct. 1855. No. **7193**. Perhaps the stems are so low from being new shoots after the forest fires. Growing in broad tufts in sunny places near Fonte Capopa; end of Sept. 1855. No. **7226**.

6. **C. elegans** Spr., *l.c.*

*Andropogon cymbarius* L. Mant. p. 303 (1771); non Hack., *l.c.*, p. 629.

Golungo Alto.—5 to 8 ft. and higher, culm ascending at the base, bearing aerial roots at the nodes, branched above, panicle huge, nodding at the top. Habit of an *Andropogon*. In marshes dried up in winter in the woods of Monte de Queta, but in few places; in fl. June and July 1856. No. **7300**. Thickets and highways near N-dele and Cacarambola; begining to wither; Sept. 1854. No. **2974**.

7. **C. filipendulus.**

*Andropogon filipendulus* Hochst. in Flora xxxi. p. 115 (1846); Hack., *l.c.*, p. 634; Durand & Schinz, *l.c.*, p. 712.

Var. **angolensis** Rendle var. nov.

Ultimate spathes exceeding the common peduncle of the pair of racemes; spikelets, excepting the margins, glabrous.

Huilla.—Lofty thickets of Morro de Monino; May 1860. No. **7524**. No. **2948***b* (no notes).

The following may belong to this species.

Pungo Andongo.—In marshy meadows near Sansamanda; end of Feb. 1857. No. **2783***b*. Forest meadows near Sansamanda; May 1857. No. **2773**. Both specimens have been disfigured by a fungus *Ustilago Cesatii* Fisch. de Waldh. (determined by Miss Smith).

8. **C. finitimus.**

*Andropogon finitimus* Hochst. ex A. Rich., *l.c.*, p. 465; Hack., *l.c.*, p. 637; Durand & Schinz, *l.c.*

Pungo Andongo.—A grass of gregarious growth, 4 to 6 ft. high, with branched culms. Plentiful in secondary thickets at the base of huge rocks near Caghuy; 28 March 1857. No. **2838**.

9. **C. Welwitschii** Rendle sp. nov.

*Andropogon Chrysopogon* Welw. ms. in herb.

Tall, 2 to 9 ft. high, with strong generally erect culms unbranched in the lower part, or decumbent at the base and rooting

at the lower nodes; nodes ferruginously hairy; sheaths glabrous; ligule broad, obtusely rounded or truncate, glabrous, continued laterally down the sheath forming membranous veined wings; lamina linear, or narrowly linear-lanceolate, constricted at the base and tapering above to a setaceous apex; panicle large, diffuse, lax, in the larger specimens axillary as well as terminal; ultimate spathes rufescent, lanceolate, generally very narrowly lanceolate, acuminate, glabrous, exceeding in length the common peduncle which is ferruginously hairy above and epinastic; racemes subsessile, with 1 and 2 fertile spikelets respectively; appendices short, blunt, reddish; spikelets oblanceolate to narrowly suboval, callus densely shortly hairy, hairs white, outer glume incompletely 9-nerved, green with a shortly produced, truncate, scarious, rufescent, nerved apex, margins recurved embracing gl. II. which slightly exceeds gl. I., and is scaphoid, 3-nerved, with scabridulous keel and mucronate apex; gl. III. hyaline, 2-nerved, with inflexed margins ciliate above; fertile glume shorter with an awn 2 to $2\frac{2}{3}$ in. long springing from between the shortly bifid apex; awn with a stout kneed ferruginously hirsutulous column and glabrous subula; pedicelled spikelets reddish, lanceolate, acute, outer glume with a weak slender awn equal or shorter than itself, inconspicuously 7- to 9-nerved, sparsely hispidulous or glabrescent; gl. II. subequal, conspicuously 3-nerved, hyaline between the nerves; gl. III. shorter, delicate, hyaline, enerved, enveloping a ♂ flower, which is sometimes aborted.

Leaf-sheaths stramineous reaching 6 in. in length, ligule $\frac{2}{3}$ to 2 lines, blade to 22 in. long by 7 lines broad, the largest plicate at the strong midrib with 5 well-marked nerves on either side, surface and margin scabridulous. Panicles 10 to 18 in. or more long; ultimate spathes 2 to $2\frac{1}{2}$ in. long; racemes 8 to 10 lines long; appendage below lowest ♀ spikelet $\frac{1}{2}$ line long, a few stiff reddish hairs near its base nearly equalling the sessile spikelet; margins of joints and pedicels white-hairy; ♀ spikelet 3 to $3\frac{1}{2}$ lines long including the callus ($\frac{3}{4}$ to 1 line); back of outer glume more or less pilosulose; gl. III. 2 lines long; gl. IV. linear, scarcely $\frac{1}{2}$ line, awn 2 to $2\frac{2}{4}$ in. Pedicel of ♂ (or neuter) spikelet $1\frac{3}{4}$ lines, spikelet $3\frac{1}{2}$ to $4\frac{1}{2}$ lines, awn 2 to 5 lines long; outer glume with subcarinate hispidulous margins and incurved hyaline edges infolded over gl. II., which is subequal linear-oblong, acute, with incurved edges round the oval-oblong gl. III. ($1\frac{2}{3}$ line long); anthers 1 line long or less.

Near *C. confinis* (*Andropogon confinis* Hochst.), but distinguished by having 2 ♀ flowers in the large raceme, by its smaller spikelets, the more membranous inconspicuously veined outer glume of the ♀ spikelet, and the narrower less membranous pedicelled spikelet with its inconspicuously nerved reddish outer glume.

Golungo Alto.—Native name Musoque. A very elegant annual or biennial grass 2 to 6 sometimes 7 ft. high, with erect culm, and reflexed or horizontally spreading leaves. Plentiful by thickets and

near edges of woods in Sobato de Mussengue ; fl. Nov. 1855. 1 to 6 ft. high. By thickets near the Ambaca road ; 21 Nov. 1855. No. **7190.** Culm 9 ft. high, very hard ; when growing solitary becomes decumbent and roots at all the lower nodes, and so a single plant forms in a few months a very dense little wood. In reedy places near Undele and Candombo, forming the so-called Capineta ; beginning of June 1855. No. **2955.** 5 to 8 ft. and higher, leaves usually reddish, culm very hard. Plentiful in Capineta near Sange, Bango ; June 1855. No. **2956.** 5 to 8 ft., with nodding culms bearing long very dense hairy rings at the nodes. Grows sparsely by the cataracts of the Cuango ; beginning of Aug. 1855. No. **3000.** By margins of thickets near the base of the Queta Mts., to the left of the Cuango ; end of June 1855. No. **7248.**

Var. **minor.** Apparently a smaller less robust growing plant, reaching about 3 ft. in height, nodes glabrous ; ultimate spathes of inflorescence purplish, 2 in. long, the racemes of each pair often of equal strength, having two ♀ flowers ; awns strong 3 in. long.

Pungo Andongo.—Plentiful in the lofty mountain of Pedra de Cabondo in the præsidium ; middle of April 1857. No. **2820.** In rich woody places between Pungo Andongo and Catete ; May 1857. No. **7420.**

10. **C. Humboldtii** Spr., *l.c.*, p. 15.

*Andropogon bracteatus* Willd. Sp. Pl. iv. p. 914 (1805) ; Hack., *l.c.*, p. 643.

Pungo Andongo.—Candumba ; Jan. 1857. No. **2758.** Attacked by the same fungus as are the specimens from Huilla.

Huilla.—In grassy wooded places near Lake Ivantâla ; end of Feb. 1860. No. **7513.** Sheaths of upper leaves barbato-pilose. In wooded meadows at Monino ; April 1860 No. **7514.** Very plentiful in rather damp meadows between Monino and Lake Ivantâla ; end of March 1860. No. **7512.** In rather damp meadows of tall grass between Lopollo and Monino ; Feb. 1860. No. **2657.**

In the last two numbers the spikelets have become deformed by smut, which Miss Smith has determined as *Ustilago Cesatii* Fisch. de Waldh., a species which like its host-plant is hitherto unrecorded for the Old World.

11. **C. andongensis** Rendle sp. nov.

Perennial by a creeping woody much-branched rhizome, rufescent ; culms ascending, much-branched, nodes glabrous, sheaths loose, exceeding the internodes, glabrous or subglabrous below hairy above, hairs long, soft, with tuberculate base, ligule subscarious, reddish, truncate, lamina narrow-linear tapering to the base and aristiform apex, midrib prominent, upper face scabridulous sometimes sparsely pilose, lower face minutely scabridulous ; inflorescence laxly branched, linear or oval in outline ; raceme pairs generally shorter than, rarely exceeding the lanceolate acuminate spathe ; common peduncle and pedicels subglabrous, one raceme subsessile, the other shortly stalked, the former with a basal homogamous pair, each with 2 or 3 pairs of heterogamous spikelets ; a short blunt liguliform process below

the lowest ♀ spikelet; rhachis-joints and pedicels flat with densely shortly pale fulvous hairy margins; spikelets reddish; sessile spikelet exceeding the rhachis-joint, callus short, blunt with a subequal tuft of hairs on each side, oblong-lanceolate, broadest in the middle; outer glume coriaceous, glabrous with a scarious scabridulous 2-denticulate apex, elliptical-oblong, margins convolute, many-nerved, usually the 3 (sometimes 1 or 5) central nerves form conspicuous parallel ridges; gl. II. subequal, 3-nerved, broadly navicular, blunt; gl. III. hyaline, oblong, tapering to a blunt apex, 2-nerved, margins inflexed ciliolate above; fertile glume hyaline, linear from a weak stipitiform base, apex bifid, awn 3 times the length of the spikelet, column brown, shortly villous, shorter than the pale subula; pale short, rounded, lodicules broadly cuneate, ovary glabrous; pedicelled spikelet lanceolate, acute, larger than the sessile; outer glume inconspicuously many-nerved; gl. II. slightly shorter, 3-nerved, narrowly navicular, mucronate; gl. III. hyaline, oblong, blunt, 3-nerved, flowering glume hyaline, narrow.

Specimen $2\frac{1}{2}$ ft. high, upwardly spreading, internodes terete, lower 1 to $1\frac{1}{2}$ in. long, becoming longer above; ligule glabrous 1 to $1\frac{1}{2}$ lines long; the narrow subflattened leaf-blades reaching 9 in. in length, $2\frac{1}{2}$ lines or less in breadth, much longer than the sheaths. Inflorescence a foot or less in length; ultimate spathes $1\frac{1}{2}$ to $2\frac{1}{4}$ in. long, racemes $\frac{3}{4}$ to 1 in. long (excluding awns), pedicels $\frac{1}{2}$ line and 2 lines respectively; scarious process beneath lowest ♀ spikelet reddish, $\frac{1}{2}$ to $\frac{4}{5}$ line long. Rhachis-joint red 2 lines long; sessile spikelet $3\frac{1}{2}$ lines including the callus ($\frac{1}{2}$ line); point of insertion oblique, leaving no scarious appendage; gl. III. $2\frac{1}{2}$ lines long; fertile glume 2 lines, awn 9 to 10 lines, pale $\frac{1}{2}$ line. Pedicels $1\frac{1}{2}$ to 2 lines long, bearing ♂ spikelets 4 to 5 lines long, margins of flattened outermost glume narrowly incurved becoming carinulate above the middle, keels scabridulous; gl. II. $3\frac{1}{2}$ to 4 lines, hyaline between the nerves; gl. III. $3\frac{1}{2}$ lines, the margin ciliolate in the upper $\frac{2}{3}$; flowering glume scarcely 3 lines, margin ciliolate above.

Near *A. bracteatus* Willd., but easily distinguished by habit, the markedly ridged outer glume of the sessile spikelet, and the shorter weaker awn.

Pungo Andongo.—A widely cæspitose grass. Caghuy; April 1857. No. **2728**.

A starved-looking form with more slender stems, narrower leaves, and smaller racemes with smaller spikelets (sessile 3 lines long, pedicelled $3\frac{1}{2}$ lines) occurs in the same district. In wooded rocky places (elephant hunters' pits) near Mopopo; April 1857. No. **7396**.

12. **C. Ruprechti.**

*Andropogon Ruprechti* Hack. *l.c.*, p. 645; *A. macrolepis* Hack. in Flora lxviii. p. 125 (1885), Mon. Androp. p. 646, in part; Durand & Schinz, *l.c.*, p. 717, in part.

Pungo Andongo.—Calunda: Feb. 1857. No. **2712**.

Huilla.—Wooded meadows, Monino; April 1860. No. **7523**.

15. **THEMEDA** Forsk. Fl. Æg.-Arab. p. 178 (1775).

*Anthistiria* Linn. f. Nov. Gram. Gen. p. 35 (1779); Benth. & Hook. f. Gen. Pl. iii. p. 1136.

1. **T. triandra** Forsk., *l.c.*

*T. Forskalii*, vars. *vulgaris* and *imberbis*, Hack. Mon. Androp. p. 660; Durand & Schinz, Consp. Fl. Afr. v. p. 730.

Pungo Andongo.—Damp meadows near Sansamanda; Feb. 1857. No. **2785**. Tall grassy places near Lombe and Quibinda; March 1857. No. **2839**.

Huilla.—Higher wooded meadows of Monino, but growing sparsely for more specimens were vainly sought; May 1860. No. **2701**.

### Tribe II. *MAYDEÆ*.

16. **COIX** L.; Benth. & Hook. f. Gen. Pl. iii. p. 1112.

1. **C. Lachryma-Jobi** L. Sp. Pl. p. 972 (1753); Steud. Syn. Fl. Gram. p. 9 (1854); Welw. Synops. Explic. p. 54 (1862); Durand & Schinz, Consp. Fl. Afr. v. p. 693.

Ambaca.—In marshy places between Pumba and Puri-Cacarambola, thoroughly spontaneous; Oct. 1856. No. **3004**.

Cazengo.—A grass, native of East India, now spontaneous in southern Europe and tropical Africa; cultivated in central Europe as an annual, but observed as a perennial in Serra d'Acrabida, Portugal. Probably introduced by missionaries, like *Abrus*, etc., for making rosaries. Grows in wooded places sporadically by streams and springs, with very large cæspitose shoots. In fruit the whole year. On the banks of the river Moembege, near Dalatando; June 1855. No. **7241**.

17. **ZEA** L.; Benth. & Hook. f. Gen. Pl. iii. p. 1114.

1. **Z. Mays** L. Sp. Pl. p. 971 (1753); Benth. in Hook. Niger Fl. p. 557 (1849); Steud. Syn. Pl. Gram. p. 9 (1854); Welw. Synops. Explic. p. 35 (1862); Durand & Schinz, Consp. Fl. Afr. v. p. 692.

Native name Massa, Welw. Apont. p. 540 (1859).

Loanda.—The whole stem and the panicle of male flowers purplish. Commonly cultivated in the whole country of Angola, promiscuously with the typical form with a green stem, etc. Picked in gardens (Esquina de Bengo); July 1854. No. **7320**.

Ambaca.—Milho gigante de Casange. Nov. 1855. Coll. Carp. 1101.

### Tribe III. *PANICEÆ*.

18. **PASPALUM** L.; Benth. & Hook. f. Gen. Pl. iii. p. 1097.

1. **P. paniculatum** Gaertn. Fruct. & Sem. ii. p. 2, t. 80 (1791); (non Linn.).

*P. multispica* Steud. Syn. Pl. Gram. p. 18 (1854).

Prince's Island.—Here and there in rather dense damp woods, Pico de Papagaio; Sept. 1853. No. **2929**.

Note.—*P. paniculatum* L. Syst. ed. x. p. 855 (1759) is founded on Sloan. Jam. t. 72, f. 2. The type in Herb. Sloane (fol. II. p. 37) is *Panicum fasciculatum* Sw. Gaertner gives the same reference to Sloane, but his figure represents what we understand now by *Paspalum paniculatum*, which is therefore of Gaertner, not Linnæus.

2. **P. conjugatum** Berg. in Act. Helv. vii. p. 129, t. 8 (1762); Benth. in Hook. Niger Fl. p. 557 (1849); Steud., *l.c.*, p. 21; Durand & Schinz, Consp. Fl. Afr. v. p. 736.

Sierra Leone.—Sept. 1853. No. **2937** (in part).

Prince's Island.—Primæval woods at foot of Pico de Papagaio; Sept. 1853. No. **2927.**

3. **P. scrobiculatum** L. Mant. p. 29 (1767); Benth., *l.c.*; Steud., *l.c.*; Durand & Schinz, *l.c.*, p. 738.

Sierra Leone.—Leaf-sheaths and leaves more or less hairy; spikelets small ($\frac{3}{4}$ to $\frac{5}{6}$ line). Sept. 1853. Nos. **2937** (in part), **2941.**

Ambriz.—Nov. 1853. No. **2892***b*.

Golungo Alto.—Rather plentiful in sparsely grassy sunny places near Cacarambola, sometimes prostrate, sometimes erect; Feb. 1855. No. **2987.**

Pungo Andongo.—Damp meadows near Sansamanda; Feb. 1857. Nos. **2794**, **2795**. Muta Lucala in marshy meadows: Mar. 1857. No. **2707.**

4. **P. distichum** L. Amœn. Acad. v. p. 391 (1760); Benth., *l.c.*; Steud., *l.c.*, p. 29; Durand & Schinz, *l.c.*, p. 737.

*P. vaginatum* Sw. Prod. p. 21 (1788).

Madeira.—Hills above Funchal; Aug. 1853. No. **2918.**

Loanda.—No. **7327.**

19. **DIGITARIA** Heist. ex Adans. Fam. ii. pp. 38, 550 (1763).

*Panicum* L.; Benth. & Hook. f. Gen. Pl. iii. p. 1101, pro parte.

1. **D. longiflora** Pers. Syn. i. p. 85 (1805).

*Panicum parvulum* Trin. in Mém. Acad. Sci. Petersb. sér. 6. iii. p. 205 (1835); Steud. Syn. Pl. Gram. p. 41 (1854). *Paspalum longiflorum* Retz., Obs. iv. p. 15 (1786); Durand & Schinz, Consp. Fl. Afr. v. p. 737. *P. brevifolium* Flügg. Monogr. p. 150 (1810); Benth. in Hook. Nig. Fl. p. 557 (1849).

Sierra Leone.—Sept. 1853. No. **2946.**

Golungo Alto?—No. **7256** (no notes).

Pungo Andongo.—A grass like a *Cynodon*, with prostrate culms rooting at the nodes, fertile ones erect, very slender: spikes geminate or ternate, a shining yellowish-green. On rocks covered with a sandy clayey earth at Pedras de Guinga; plentiful but not often in flower; Mar. 1857. No. **2935.**

2. **D. ternata** Stapf in Fl. Capens. vii. p. 376 (1898).

*Panicum ternatum* Hochst. in Flora xxiv. Intelligenzbl. i. p. 19 (1841) (nomen); Steud., *l.c.*, p. 40; Durand & Schinz, *l.c.*, p. 766. *Cynodon ternatum* A. Rich. Tent. Fl. Abyss. ii. p. 405 (1851).

Pungo Andongo.—A laxly cæspitose grass with the habit of *Digitaria*; apparently annual. Meadows between Bumba and N'billa (Umbuilla); March 1857. No. **7436.**

3. **D. monodactyla** Stapf., *l.c.*, p. 373.

*Panicum monodactylum* Nees Fl. Afr. Austr. p. 21 (1841); Steud., *l.c.*, p. 56; Durand & Schinz, *l.c.*, p. 755.

Pungo Andongo.—In wooded pastures covered with short grass near Quilanga; April 1857. No. **2823.** Laxly cæspitose, with ascending culms, and simple, very long, slender spike. Plentiful in

wooded meadows on the slopes between Candumba and Calundo : March 1857. No. **7431**. No. **2847** (no notes).

Huilla.—In the more elevated meadows at Oahoia, Sobato Humpata ; April 1860. No. **2662**.

4. **D. diagonalis** Stapf, *l.c.*, p. 381.

*Panicum diagonale* Nees, *l.c.*, p. 23 ; var. *uniglume* Hack. in Engl. Hochgebirgsfl. Trop. Afr. p. 117 (1892) ; Durand & Schinz, *l.c.*, p. 747. *P. uniglume* Hochst., *l.c.* (nomen) ; A. Rich, *l.c.*, p. 370.

Pungo Andongo.—Nos. **2859**, **2871** (no information).

5. **D. fenestrata.**

*Panicum fenestratum* Hochst., *l.c.* (nomen) ; Steud., *l.c.*, p. 40 ; Durand & Schinz, *l.c.*, p. 749. *P. sanguinale* L. var. *fenestratum* A. Rich ex Schweinf. in Bull. Herb. Boiss. ii. app. 2. p. 18 (1894).

Golungo Alto.—Rather rare in fields planted with cotton on the left of the river Quiapoze, near Sange ; Aug. 1855. No. **7173**.

Pungo Andongo.—A widely spreading cæspitose grass, yielding very good fodder. On damp grassy slopes on the higher rocks of the præsidium ; Nov. 1856. No. **2739**.

6. **D. debilis** Willd. Enum. Pl. Berol. p. 91 (1809).

*Panicum debile* Desf. Fl. Atlant. i. p. 59 (1798) ; Steud., *l.c.*, p. 41 ; Durand & Schinz, *l.c.*, p. 746.

Pungo Andongo.—No. **2854** (no notes).

Var. **gigantea** Rendle var. nov.

A very large variety with a stout creeping stem, $1\frac{1}{2}$ line in thickness, rooting profusely at the nodes, and passing into a stout erect stem 3 ft. high, ending in a subcorymbose inflorescence 11 in. long. The long spikes (lowest 8 in.) are ascending from a stout common rhachis 3 in. long. The narrow spikelets closely resemble those of the type, but are even more acuminate, the lowest barren glumes being almost awned. It has every appearance of a gigantic specimen of the type, as it occurs in northern and tropical Africa.

Pungo Andongo.—Calunda ; Mar. 1857. No. **2710**.

7. **D. sanguinalis** Scop. Fl. Carniol. ed. ii. i. p. 52 (1772).

*Panicum sanguinale* L. Sp. Pl. 57 (1753) ; Steud., *l.c.*, p. 39 ; Durand & Schinz, *l.c.*, p. 761.

Var. **ciliaris** Hook. f. Fl. Brit. Ind. vii. p. 15 (1896).

*Panicum ciliare* Retz., *l.c.*, p. 16.

Sierra Leone.—Sept. 1853. No. **2937** (in part).

Loanda.—No. **7322** (no notes). Quicuxe ; May 1854. No. **7468**. Maianga do Povo ; Mar. 1854. No. **7470**. No. **7349** (no information).

Barra do Dande.—In woody places near the lake at the margin of the river Dande, near Bombo ; Sept. 1858. No. **7280**.

Var. **extensa** Hook. f., *l.c.*

Pungo Andongo ?—No. **2855** (no information).

Var. **horizontalis** Durand & Schinz, *l.c.*, p. 763.

*P. horizontale* Mey. Prim. Fl. Esseq. p. 54 (1818) ; Benth. in Hook. Niger Fl. p. 560 (1849). *Digitaria horizontalis* Willd. Enum. p. 92 (1809).

Sierra Leone.—Sept. 1853. No. **2943**.

Golungo Alto.—Frequent in woody meadows near Bumbo and Sange. A grass 1 to 4 ft. high like a *Digitaria*, thickly crowded with other grasses, especially species of *Panicum* on the margins of thickets; Dec. 1854. No. **7184**.

Var. **interrupta** Rendle var. nov.

Perennial; shoots tall, strict, erect; spikes (11) ascending with a slender trigonous rhachis, spikelets in interrupted pairs, oval, narrowing to an obtuse apex, $1\frac{1}{3}$ line long; subsidiary glume minute, triangular; barren glumes subequal, with well-marked nerves and 4 lines of short ascending hairs, oval, the lower slightly narrower, 5-nerved, tapering to a blunt fimbriated apex, the upper 7-nerved and tapering to a blunt point; fertile glume broadly oval, obtuse, inconspicuously 3-nerved, the edges incurved and becoming very thin, membranous, and enclosing a slightly narrower pale.

Stems 3 to $3\frac{1}{2}$ ft. with pubescent nodes. Leaves long, linear-tapering, glabrous; sheaths glabrous, sparsely pilose at the mouth; ligule short, membranous, truncate. Spikelets bluish.

Huilla.—Grassy hills near Lopollo towards Catumba; end of Feb. 1860. No. **2675**.

8. **D. moninensis** Rendle sp. nov.

Perennial with a slender woody rhizome; stems erect, slender, stramineous; nodes hairy; basal leaves short, linear-lanceolate to linear-tapering, cauline with long sheaths and short linear-lanceolate acuminate blades much shorter than the internodes; spikes dense, binate; rhachis flattened, margined, flexuose; spikelets generally in groups of four (sometimes fewer) on flexuose pedicels varying in length, ovate, plano-convex, clothed with long shining rosy-purplish silky hairs; subsidiary glume minute, delicate, transparent, enerved, embracing the base of the spikelet; outer barren glume green, narrow-lanceolate, 3-nerved, densely clothed with short stiffish hairs, shorter than the fertile glume; inner barren glume longer than the outer, ovate, shortly acuminate, flat with incurved hairy edges, strong midrib, and two pairs of weaker lateral nerves, membranous between the nerves, epaleate; fertile glume sharply convex, oval, shortly acuminate, coriaceous, yellowish-brown, minutely transversely punctulate; pale subequal flattened.

Plants 14 to 26 in. high. Leaf-sheaths cylindrical, appressed, closely striolate, the lower hairy, 1 to 3 in. long, hairs ascending or suberect, the cauline subglabrous, 5 to 7 in.; ligule short, membranous, truncate, less than $\frac{1}{2}$ line long, upper margin bearing a row of erect whitish hairs; blades flat, margined, acute, lower face hairy like the sheaths, upper striate, glabrous, the lower generally $\frac{1}{2}$ to 3 in. long by $1\frac{1}{2}$ to 2 lines broad, the cauline 1 in. or less. Spikes 3 to 4 in. long, ultimately diverging, rhachis $\frac{1}{4}$ to $\frac{1}{3}$ line broad. Spikelets (including hairs) 2 lines long, pedicels from scarcely 1 to nearly 3 lines; subsidiary glume not exceeding $\frac{1}{2}$ line, truncate or very obtuse, or irregular in shape; outer

barren glume $1\frac{1}{3}$ line, inner $1\frac{1}{3}$ line not including the hairs which exceed it; hairs reddish or whitish, borne on the back of the margin in the upper half, and in two tufts on either side of the base; fertile glume $1\frac{1}{2}$ line, inconspicuously 3-nerved; pale flat, punctulate dorsally like the glume. Lodicules cuneate-quadrate.

Recalls the South African forms of *Panicum commutatum* Nees, but is distinguished at once by its less regular binate spikes, with broader strongly convex long-silky-haired spikelets.

Huilla.—In rich pastures at Monino; April 1860. No. **2676**.

9. **D. angolensis** Rendle sp. nov.

Perennial (?), stem erect or with an ascending base, leafy; leaves rather broadly linear, tapering to the base and acute apex, ligule membranous truncate, sheaths longer than the internodes; spikes (8) subcorymbosely fastigiate, rhachis narrow, trigonous; spikelets crowded, in groups of 4, plano-convex, softly pubescent, oval, subacute, $1\frac{1}{3}$ line long; subsidiary glume very small, rounded, barren glumes subequal, 3-nerved, fertile glume slightly shorter, oval, abruptly acute, glabrous.

Plants about 2 ft. high. Stems rather stout, flexuous. Nodes glabrous; leaf-sheaths loose, glabrous or sparsely hairy in their upper part, where they may also be subcarinate; blades glabrous, spreading, margin thickened and minutely crispulate, midrib subprominent below, 5 to 7 in. in length by 4 lines in breadth. Spikelets long- and short-stalked, often viviparous. Subsidiary glume thin and translucent; barren glumes $1\frac{1}{3}$ line long, oval, narrowing above to a subacute tip, covered with long ascending whitish hairs, the lower concave, the upper flattened dorsally with sides incurved at the lateral nerves; fertile glume, just over a line in length, very concave with strongly incurved edges, inconspicuously 3-nerved; pale similar but flatter and slightly narrower.

Pungo Andongo.—Damp meadows near Sansamanda; Feb. 1857. No. **2790**.

10. **D. nitens** Rendle sp. nov.

Perennial, cæspitose, with a densely woolly base; stems and leaves erect, leaves rigid, narrow-linear, sharply pointed; panicle elongated, branches filiform, ascending; spikelets, $1\frac{1}{2}$ line, lanceolate, outer glumes covered with silvery-white hairs; subsidiary glume absent; lower barren glume triangular, $\frac{2}{3}$ the length of the upper and of the fertile glume; upper barren glume lanceolate, 5-nerved; fertile glume ovate, 3-nerved.

The short rhizome and withered bases of leaf-sheaths covered with soft densely matted woolly hairs; roots wiry. Shoots of present season 20 to 27 in. long, unbranched, leafy to above the middle, internodes polished, slender; nodes glabrous. Leaf-blades finely striate with scabridulous margins, ending in long sharp points, at the base of the stem often pilose, above glabrous, generally 3 to 6 in. long by 1 to $1\frac{1}{3}$ line broad; sheaths loose, shorter or longer than the internodes; ligule membranous, short,

truncate, generally oblique. Panicle 5 to 7 in. long; rhachis slender, elongated, bearing numerous filiform lateral branches on which the spikelets are arranged singly, or, in the lower portion, on short few-flowered branchlets; articulation of spikelets large, shortly hairy. Lower glume acutely triangular from a rounded gibbous base, 3-nerved, densely covered with long stiff hairs, $1\frac{1}{5}$ line long; upper subacute with thinly membranous incurved edges, the nerves densely hairy, $1\frac{1}{2}$ line long; fertile glume slightly shorter than the upper barren glume, glabrous, the edges incurved above the middle, thin, and translucent, becoming convolute above to form an abruptly acute apex; pale narrower, similar in form and texture to the glume.

HUILLA.—A cæspitose grass, with erect leaves and culms, and silvery-shining spikelets. Common in sandy clayey thickets near Lopollo; 2 Dec. 1859. No. **2634**.

Material insufficient for specific determination:—

SIERRA LEONE.—Sept. 1853. No. **2942**.

20. **ERIOCHLOA** H. B. & K.; Benth. & Hook. f. Gen. Pl. iii. p. 1099.

1. **E. polystachya** H. B. & K. Nov. Gen. & Sp. i. p. 95, t. 31 (1815); Durand & Schinz, Consp. Fl. Afr. v. p. 739.

*E. annulata* Kunth Rev. Gram. i. p. 30 (1829). *E. punctata* Hamilt. Prodr. Pl. Ind. Occ. p. 5 (1825); Durand & Schinz, *l.c.*, p. 739. *Panicum annulatum* A. Rich. Tent. Fl. Abyss. ii. p. 370 (1851).

LOANDA.—Banks of ponds in sandy clayey soil above Forte do Conceiçao; rather rare; perennial; 12 July 1854. No. **7344**. A grass a foot high, in habit simulating a dwarf form of *Glyceria fluitans*. In clayey sandy soil round the artificial ponds (represa), of Sr. Luiz Gomes, south of Loanda; May 1858. No. **7289**. A small prostrate perennial grass. Around ponds, dry in winter, near Bemposta, but sparse; Jun. 1858. No. **7283**.

21. **ISACHNE** R. Br.; Benth. & Hook. f. Gen. Pl. iii. p. 1100.

1. **I. angolensis** Rendle sp. nov.

Shoots decumbent and much branched below, then erect, leafy up to the panicle, leaves narrowly sublanceolate-linear, acute; panicle large, habit of *I. multiflora* Trim., branches spreading, densely flowered in the upper two-thirds from the appressed secondary branches; spikelets like the rhachis and branches reddish-purple, oval, blunt, 1 line long; barren glumes subequal with broad colourless margins; lower fertile glume oval, overtopping the barren glumes, enclosing a ♀ flower, upper shorter enclosing a ♀ flower.

Shoots copiously branched below, rooting at the lowermost nodes, nearly $1\frac{1}{2}$ ft. high; nodes geniculate, purplish, glabrescent. Leaves 2 to 4 in. long by 2 to $2\frac{1}{2}$ lines broad, glabrous, faces verruculose, veining rather prominent on the lower; ligule comprising a row of rather long (1 line) whitish hairs; sheaths, except the uppermost, about equal to the internodes, striate, tinged

with purple, margins ciliate. Panicle scarcely fully expanded, 6 in. long by 4 in. broad, broadly ovate in outline. lower branches 2½ in. long becoming shorter above, branchlets and pedicels very shortly hairy, pedicels equal to, or 2 to 3 times the length of, the spikelets. Barren glumes membranous, purplish with a broad thinner colourless margin, very blunt, the lower oval, 5- to 7-nerved, with a few stiff erect hairs near the top, ⅔ line long, the upper ovate, 7-nerved, glabrous, slightly shorter than the lower (½ line long); lower fertile glume nearly 1 line, subcoriaceous, 7-nerved, broadly oval, with a bluntly-pointed apex and a few stiff short hairs at the base, the incurved edges enveloping a more narrowly oval pale with a ☿ flower, anthers purple, styles very feathery; upper fertile gl. ⅔ line, coriaceous, oval, 7-nerved, setuliferous at the base with a few scattered short hairs above, enclosing a narrower pale with a ♀ flower.

Has the habit of *I. multiflora* Trim., but is distinguished by the characters of the spikelet, which is narrower with much narrower fertile glumes.

Huilla.—Damp rocks at Morro de Lopollo. At the cataract; end of March 1860. No. **7499**.

22. **PANICUM** L.; Benth. & Hook. f. Gen. Pl. iii. p. 1100, pro parte.

Sect. 1.—Brachiaria.

1. **P. brizoides** Lam. Illustr. 1. p. 170 (1791).

*P. paspalodes* Pers. Syn. i. p. 81 (1805); Benth. in. Hook. Niger Fl. p. 560 (1849); Steud. Syn. Pl. Gram. p. 60 (1854) (errore *paspaloides*).

Mossamedes.—Sandy places at the river Maiombo, near Bisaco, growing with various Cyperaceæ; Oct. 1859. No. **2638**. A perennial stoloniferous creeping grass, ½ to 2 ft., in form like *Beckmannia*, rather succulent and affording excellent fodder for cattle. Very common in woody damp places at the mouths of the rivers Giraûl (or Quinina) and Maiombo, and round Lake Giraûl; July 1859. No. **2289**.

2. **P. andongense** Rendle sp. nov.

Perennial, 2½ ft. high, with a tuft of spreading branching shoots; leaves patent, linear-lanceolate, acute, with rigid minutely aculeate margins; spikes short, distant, sessile; spikelets few, turgid, closely arranged in two rows on a slender flexuose rachis, 1⅓ line long, obovate, sparsely puberulous; glume I. blunt about ⅓ gl. II.; gl. II. very concave, a little shorter than gl. III., which is coriaceous, obovate, and encloses a large broad pale and ♂ flower; fertile gl. nearly equal to the last, obovate, enclosing a ☿ flower.

A number of shoots spring in a tuft from the short hard rhizome; they spread and branch copiously, becoming with their ascending branches finally erect, and ending in long subfiliform spike-bearing axes; nodes puberulous. Leaf-sheaths generally strict or appressed, except in the lower parts shorter than the internodes, striate with pilose edges and mouth; ligule short,

membranous, pilose; blade stiff, glabrous, $1\frac{1}{2}$ to $3\frac{1}{2}$ in. long by 2 to 4 lines broad. Spikes generally 8, near the end of the long axis, separated by internodes about equal to their own length, decreasing in size from below upwards, 2- to 8-flowered, the uppermost reduced to a single spikelet, rhachis sparsely pilose. Glume I. triangular-ovate, membranous, 3-nerved, $\frac{3}{4}$ line long; gl. II. thicker, very broadly oval, very concave and blunt, inconspicuously 5-nerved, 1 line long; gl. III. concave, with edges strongly incurved above, and apiculate, 5-nerved, $1\frac{1}{3}$ line long, enclosing a membranous obovate pale with edges sharply inflexed at the strongly marked nerves; anthers dark-coloured; fertile gl. coriaceous, minutely scabrid, blunt, very inconspicuously 3-nerved, $1\frac{1}{4}$ line long, the incurved edges enclosing the well-fitting pale.

The form of the inflorescence and the shape of the spikelet recall *P. brizoides* Lam., but the rhachis is slender, not broad as in that species, while the habit and the stiff lanceolate leaves with their minutely serrulate margin are very characteristic and distinct.

Pungo Andongo.—Wet places in the præsidium; Feb. 1857. No. **2793**.

3. **P. brizanthum** Hochst. in Flora xxiv. Intell. 1, p. 19 (1841) (nomen); A. Rich. Tent. Fl. Abyss. ii. p. 363 (1851); Steud., *l.c.*, p. 63; Durand & Schinz, *l.c.*, p. 742.

Pungo Andongo.—Calunda; March 1857. No. **2713**. A perennial grass, laxly cæspitose, with flat erect leaves, and erect slender almost naked culms 3 to 4 ft. high, bearing at the top 3 to 6 subfalcate spikes closely beset with unilateral spikelets. In habit like a *Paspalum*. Here and there in rather damp meadows at the river Cuanza near Mopôpo; April 1857. No. **2822**. Meadows near Sansamanda; Feb. 1857. No. **2796**.

4. **P. falciferum** Trin. Gram. Panic. p. 127 (1826), Icon. et Descript., t. 147 (1829); Benth., *l.c.*, p. 560; Steud., *l.c.*, p. 57; Durand & Schinz, *l.c.*, p. 749.

Pungo Andongo.—In marshy places near Quibanga; Jan. 1857. No. **2775**. No. **2845** (no notes).

A larger coarser plant than the Huilla one, and also characterised by the broad rhachis fringed with ferruginous hairs twice as long as the spikelets. Specimens collected in Gambia by Mungo Park resemble this form.

Huilla.—Shady rather dry pastures near Lopollo; Feb. 1860. No. **2652**.

Smaller slenderer plants than those from Pungo Andongo, the narrower rhachis bearing only a few almost colourless hairs, resembling therein Trinius' figure and description.

There is some discrepancy in the size and neuration of the outermost glume in the specimens which I have examined and Trinius' figure. In plants from Cape Coast, Accra, Gambia, and Angola it is invariably truncate and generally 5-nerved. It varies in length from $\frac{2}{3}$ to $\frac{3}{4}$ the length of the third glume.

5. **P. brevispicatum** Rendle sp. nov.

Annual forming a tuft of numerous decumbent shoots rooting

at the lower nodes and densely leafy below; leaves short, linear-lanceolate, acute, margins thickened, often minutely aculeate; spikes 1 or 2, short, consisting of a row of oval sessile spikelets alternating on the lower surface of the somewhat broadened rhachis; glume I. oblique, with numerous parallel nerves, loosely wrapping the base and as long as the spikelets; gls. II. and III. similar, slightly shorter than gl. I., veins (7 or 5) with conspicuous cross unions, the third subtends a large pale with a ♂ flower; fertile gl. equal to II. and III., concave, oval, finely transversely rugulose.

Shoots to $1\frac{1}{2}$ ft. long; nodes glabrous; lower internodes short slender (1 in. or less) completely covered by the loose subcompressed sheaths which are striate and glabrous with shortly hairy edges and mouth. Ligule very short, truncate, membranous; leaf-blades ascending or spreading, glabrous beneath, sparsely hairy above, $1\frac{1}{2}$ to $2\frac{1}{2}$ in. long, 3 to 4 lines broad, flattened or with incurving edges. Spikes single, or a secund pair at the end of the long slender axis, $\frac{3}{4}$ to 1 in. long. Spikelets 8 to 10 in a dense single row; the very short pedicel bears a few white hairs. Glume I. large, membranous, ovate to oval, with a rounded apex and numerous (17) parallel nerves, $1\frac{1}{2}$ line long; gl. II. membranous, broadly oval, rounded, nerves 7, converging above, $1\frac{1}{3}$ line long; gl. III. 5-nerved, with a broad pale with well-marked nerves and strongly incurved edges, anthers orange-coloured; fertile gl. with a closely fitting pale and ♀ flower; lodicules large ($\frac{1}{3}$ line long), subquadrate.

Near *P. falciferum* Trin., but distinguished by its broad spreading leaf-blades, its glabrous spikelets arranged in a single row with the large loose many-nerved outer barren glume.

Pungo Andongo.—Damp meadows near Muta Lucala; March 1857. No. **2726**. Common in sandy low-lying wooded meadows between Condo and Quisonde; March 1857. No. **2829**.

A specimen collected in Gambia by Mungo Park belongs to the same species. It has longer leaves ($2\frac{1}{2}$ to $4\frac{1}{2}$ in.) and spikes (to $1\frac{1}{2}$ in.) than Welwitsch's plants.

6. **P. humidicolum** Rendle sp. nov.

Stem stout, creeping, branching at its terminal node and emitting a tall ascending thin erect shoot; leaves stiff, broadly linear-lanceolate, subacute; spikes 4 to 5, secund; spikelets large ($2\frac{1}{2}$ lines) oval, in a dense single row on the lower face of the scarcely broadened rhachis; glume I. nearly as long as the spikelet, blunt with numerous parallel nerves; gls. II. and III. equal, hairy on the back, 7-nerved, with conspicuous cross-unions, blunt or apiculate, the third subtending a pale with a ♂ flower; fertile gl. oval, minutely apiculate and finely transversely rugulose.

Creeping stem 1 ft. long in the single specimen, internodes 1 to 3 in. long by 2 lines in thickness, leaves as in the erect shoot. Erect shoot, with a geniculate ascending base, 4 ft. long; lower internodes 3 in. long, upper much longer, and with a circlet of

hairs beneath the large brown glabrous nodes. Sheaths $\frac{1}{2}$ to $\frac{2}{3}$ length of internodes, loose, striate, glabrous with minutely pilose edges; ligule a very narrow membranous edge, bearing a row of short stiffish erect hairs; leaf-blades ascending, $2\frac{1}{2}$ to $4\frac{1}{2}$ in. long by 5 to 6 lines broad, glabrous, rigid, with a thickened sparsely aculeate margin. Spikes $1\frac{1}{2}$ to $2\frac{1}{2}$ in. long, subascending, separated by internodes 1 to 2 in. long; rhachis and very short pedicels with stiff white hairs. Glume I. membranous sometimes with a purple blotch, oval, very blunt, 11-nerved, $2\frac{1}{3}$ lines long; gl. II. oval narrowing to the blunt apex, $2\frac{1}{3}$ lines long; gl. III. broadly ovate, much broader than the second, with incurving edges and apiculate, pale oblong-oval narrowing at the top; fertile gl. scarcely 2 lines long, with a close-fitting coriaceous pale.

Near the last two species, but distinguished by its habit and very large spikelets.

Huilla.—In rather damp wooded meadows near the river Monino, but not common; April 1860. No. **2678**.

7. **P. distichophyllum** Trin. Gram. Panic. p. 147 (1826), Icon. et Descript. t. 182 (1829); Benth. in Hook. Niger Fl. p. 560 (1849); Steud., *l.c.*, p. 57; Durand & Schinz, *l.c.*, p. 747.

Pungo Andongo.—A laxly cæspitose grass, culms prostrate-ascending very graceful, and like the lanceolate leaves bright green; panicle branches secund, spikelets greenish. In broken places and rock-fissures filled with clay at Pedras de Guinga, but seen in one place only; March 1857. No. **2934**.

8. **P. nudiglume** Hochst. in Flora xxvii. p. 253 (1844); Steud., *l.c.*, p. 68; Durand & Schinz, *l.c*, p. 756.

*P. Ruprechti* Fenzl. ex Steud., *l.c.*

Cazengo.—Frequent by margins of woods near Palmira and at Porto do Luinha; Dec. 1854. No. **7182**.

Loanda.—In poor pastures above Boa Vista; March 1854. No. **7467**. No. **7362***c* (in part) (no information).

Golungo Alto?—Nos. **7217**, **7239***b* (no information).

Var. **major** Hochst. ex A. Rich. Tent. Fl. Abyss. ii. p. 372 (1851); Durand & Schinz, *l.c.*, p. 757.

Loanda.—Conceiçao and S. Pedro; May. No. **7469**.

The spikelets are $1\frac{3}{4}$ line long, and the outermost glume is somewhat looser than in the species.

This species is near the Indian *P. Petiverii* Trin.

9. **P. fasciculatum** Sw. Prodr. p. 22 (1788); Steud., *l.c.*, p. 80.

Loanda.—No. **7335**. A pleasing grass. Quicuxe; Aug. 1857. Coll. Carp. 1089.

10. **P. serræfolium** Hochst. in Flora xxviii. p. 196 (1855); Durand & Schinz, *l.c.*, p. 765.

Loanda?—No. **7362***c* (in part) (no information).

11. **P. bolbodes** Schweinf. Beitr. Fl. Æthiop. p. 300 (1867) (nomen).

*Helopus bolbodes* Hochst. ex Steud., *l.c.*, p. 100. *Eriochloa*

*bolbodes* Schweinf. in Bull. Herb. Boiss. ii. Append. ii. p. 17 (1894) (nomen); Durand & Schinz, *l.c.*, p. 738.

Loanda.—Dried-up ponds near Museque de Luiz Gomes; Mar. 1854. No. **7352**. No. **7475** is probably from the same locality. Among herbage near ponds above Boa Vista, but rare; Mar. 1854. No. **7352***b*. No. **2906** (no notes).

Golungo Alto.—One of the grasses which form the short-lived meadows in the Golungo Alto district. It flowers in November soon after the rains. Sunny spots in sandy mud with low-growing sedges near Sange; Dec. 1854. No. **7185**. A perennial 2 to 3 ft. and more in height; common in sparsely grassy places on sandy rather damp soil. Plentiful in fields and waysides near Camilungo and on the way to Ambaca; Nov. 1855. No. **7188**.

Ambaca.—1½ to 3 ft. high, ascending, yielding excellent fodder for cattle. Pastures on the left bank of the river Lucala; Oct. 1856. No. **2741**.

Pungo Andongo. — 2 to 3 ft. high; laxly cæspitose, yielding excellent fodder for cattle. Rich shady pastures in the præsidium near Catete, etc.; Dec. 1856. No. **2766**. Mutollo; Feb. 1857. No. **2766***b*.

Huilla.—Woody meadows between Lopollo and Monino; Feb. 1860. No. **2673**.

Mossamedes.—Moist sandy places round Bero and Mata dos Capenteiros; Aug. 1859. No. **2598**.

12. **P. psammophilum** Welw. ms. in herb ampliatum.

Plants covered with a tawny pubescence, 6 to 18 in. high, varying greatly in habit according to the development of internodes, size of leaves, and density of inflorescence; shoots often densely leaved; leaf-sheaths loose, generally short and broad; ligule represented by a ridge of short hairs; blades narrowly lanceolate tapering to an acute or acuminate apex; spikelets shortly stalked, crowded in short oblong or linear dense panicles, arranged closely or laxly on the main rhachis, ovate, 2 lines long; glume I. thin, ovate, acute, $\frac{2}{3}$ length of the spikelet, gls. II. and III. membranous, subequal, broadly oval and ovate, the latter subtending a pale and ♂ flower; fertile gl. $\frac{3}{4}$ the length of the second and third, oval, subacute.

Specimens all apparently annual. Some (No. 2625) forming small plants 6 in. high with short spreading decumbent closely-leaved shoots ending in a dense panicle linear-oblong or lanceolate in outline. Others (No. 2624) have elongated widely branching spreading shoots, geniculate at the base, 1½ ft. long, with internodes 2 to 2¾ in. long, 1½ line thick below and bare above the middle, and a lax inflorescence 6 in. long. Others (No. 2626), which Welwitsch considered a distinct species, have a very thick stem (3 lines in diameter at the base), densely clothed with large woolly ascending leaves. Internodes rigid, lower nodes often swollen. Leaf-sheaths generally loose, very broad and compressed, 1 to 2½ in. long by 2 to 3 lines broad or narrower near the inflorescence, in the thick-stemmed plants 1¾ to 2½ in. long by 7 to 5 lines broad, and with conspicuous parallel veins. Leaf-blades linear-lanceolate or narrowly lanceolate from a truncate

base often much drawn out to an acute or acuminate apex, 2 to 4 in. long by 3 to 4 lines broad or in the thick-stemmed plant 7 to 8 in. by often nearly 1 in. broad just above the base; midrib conspicuous in the under surface only. Stems leafy right up to the inflorescence, which in the smaller plants (No. 2625) is $2\frac{1}{2}$ to $3\frac{1}{2}$ in. long, in No. 2626 forms a very dense narrow panicle 9 in. long with greatest width of $1\frac{1}{2}$ in. about the middle. Spikelets covered with long ascending hairs. Glume I. $1\frac{1}{4}$ to $1\frac{2}{5}$ line long, thinly membranous, 3-nerved, lateral nerves often short or even absent; gl. II. broadly oval, narrowing slightly to the blunt tip, 5- or 7-nerved, with incurving edges $1\frac{1}{2}$ to nearly 2 lines long, edges incurved; gl. III. ovate-obtuse, $1\frac{3}{4}$ to 2 lines long, 5-nerved, edges thin and incurved, enclosing an oval subequal pale and a ♂ flower; fertile gl. $1\frac{1}{4}$ line long, oval, sometimes tapering at the top, coriaceous, blunt or subacute, inconspicuously 5-nerved, glabrous, very minutely transversely rugulose on back, convex with the edges shortly inflexed and embracing the closely-fitting coriaceous pale.

A very well-marked species, recalling in the shape of the spikelet, *P. bolbodes* Schweinf. and *P. trichopus* Hochst.

Mossamedes.—*Panicum psammophilum* Welw. Habit somewhat that of *Tricholæna*, but scarcely a true *Tricholæna*, as there is no involucre. Common and widely cæspitose in rather damp sandy spots in the littoral valley between Cabo Negro and Mossamedes, at a place called "a Cazemba," near Rio Carvea; 3 Sept. 1859. No. **2624**. Plentiful in sandy gravelly places near the sea, and with *Aristida prodigiosa* almost the only grass of this desert—yet scarcely liked by cattle. July to Sept. 1859. Common on sand-covered rocks near the sea at Port Alexander, and, except for a species of *Lycium* and some *Borragineæ* the only vegetation in the place. About 150 ft. above Tiger Bay; end of Aug. 1859. No. **2626**. Plentiful in dry sandy places by the sea near the town of Mossamedes (Aguada); end of June 1859. No. **2625**.

There are also specimens in the British Museum, collected at Fish Bay by Anthony Hove.

13. **P. numidianum** Lam. Ill. i. p. 172 (1791); Benth., *l.c.*; Steud., *l.c.*, p. 61; Durand & Schinz, *l.c.*, p. 757.

Golungo Alto?—No. **2960** (no information).

14. **P. oryzoides** Sw., *l.c.*, p. 23; Steud., *l.c.*, p. 80; non *P. latifolium* L. Sp. Pl. p. 58 (1753).

Pungo Andongo.—A grass 6 to 8 ft. high-climbing, with aërial roots and bearded at the joints; rarely flowering. In thick rather damp woods on the island of Calemba between Condo and Quisonde, river Cuanza; March 1857. No. **7429**.

15. **P. gabunense** Hack. in Verh. Bot. Ver. Prov. Brandenb. xxxi. p. 70 (1890); Durand & Schinz, *l.c.*, p. 750.

Golungo Alto.—In the densest primitive forest. Cungulungulo; Feb. 1855. No. **7174**. A somewhat rigid, hard grass, dull green in colour, eminently social, thriving in the shade of primitive woods, soon disappearing never to return after the first cultivation of a place. Plentiful in dense very shady rather damp woods at Cungulungulo

along with coffee ; Feb. 1855. No. **7208**. (Judging from Welwitsch's specimens of the genus *Coffea*, the species may be *Coffea liberica* Hiern, as plants of this were collected by Welwitsch at the same place in the same month of 1855.)

Sect. 2.—Echinochloa.

16. **P. colonum** L. Syst. ed. x. p. 870 (1759); Steud., *l.c.*, p. 46; Durand & Schinz, *l.c.*, p. 742.

Loanda.—Ponds, dry in winter, near Alto das Cruzes. An annual grass, with straight culms, some ascending, more rarely rooting, forming rather loose tufts reddish-purple at the base ; June 1858. No. **7296**. Quite prostrate, rooting at the nodes, which are decumbent at the base ; May 1854. No. **7296***b*.

Golungo Alto.—A single specimen found in sunny spots inundated by November rains near Sange ; Mar. 1855. No. **7180**. A small starved form. No. **7230** (no information).

Mossamedes.—An annual grass, with ascending branched limp culms. Sandy clayey places near Giraûl ; July 1859. No. **2605**.

17. **P. Crus-Galli** L. Sp. Pl. p. 56 (1753); Steud., *l.c.*, p. 47 ; Durand & Schinz, *l.c.*, p. 744.

*Echinochloa Crus-Galli* Beauv. Agrost. p. 53 (1812).

Sierra Leone.—Sept. 1853. No. **2944** (specimen imperfect).

18. **P. pyramidale** Lam. Illustr. i. p. 171 (1791), Encyc. iv. p. 735 (error. typogr. 745) (1795–96); Steud, *l.c.*, p. 62 ; Durand & Schinz, *l.c.*, p. 760.

Barra do Bengo.—Apparently perennial, with ascending culms 3 to 5 ft. thick, soft (*i.e.* not hard), smooth, thickly softly pilose at the nodes, with glabrous sheaths, and flat leaves scabrid at the margin. Habit almost of *Oplismenus*. This species of grass is the principal component of the soft juicy fodder which is exported from the banks of the Bengo to Loanda for the stable-feeding of horses, donkeys, etc. Indigenous and cultivated on the banks of the Bengo river ; much liked by cattle ; Dec. 1853 and 1858, in fl. and unripe fr. No. **2902**. 5 to 10 ft. high. Plentiful near Quifandongo on the river Bengo ; Dec. 1853. No. **7449**. Plentiful in marshes on the river Bengo. Coll. Carp. 1084.

Loanda ?—No. **7351***b* (no information).

Pungo Andongo.—Damp places near Sansamanda; Feb. 1857. No. **2797**. Condo ; March 1857. No. **2747**.

19. **P. Crus-Pavonis** Nees Agrost. Bras. p. 259 (1829); Steud., *l.c.*, p. 48 ; Durand & Schinz, *l.c.*, p. 745.

Golungo Alto.—Banks of river Cuango ; Dec. 1854. No. **7201**. Marshy places Sobato de Bumba; growing cæspitosely on the river banks ; end of Sept. 1855. No. **7225**. A polymorphic grass as regards colour and form of spike. No. **7225***b* (no information). Common on banks of rivers Quiapose and Cuango near Sange ; Feb. 1855. No. **2986**.

Pungo Andongo.—3 to 4 ft. high, growing in dense marshy thickets ; panicles purple. Banks of river Cuanza near Candumba; Mar. 1857. No. **7430**.

Huilla.—Growing with species of *Polygonum* on the marshy banks of the river near Humpata ; April 1860. No. **7490**.

Sect. 3.—Hymenachne.

20. **P. indicum** L. Mant. p. 184 (1771); Steud., *l.c.*, p. 84.

Pungo Andongo.—Wooded marshy meadows near Pedras de Guinga; March 1857. No. **2826**.

Var. **elatum** Hook. f. Flor. Brit. Ind. vii. p. 42 (1896).

Pungo Andongo.—Damp wooded meadows between Condo and Quisonde; March 1857. No. **7411**. No. **2844** (no information).

21. **P. interruptum** Willd. Sp. Pl. i. p. 341 (1797); Steud., *l.c.*, p. 66; Durand & Schinz, *l.c.*, p. 751.

Golungo Alto?—No. **2963** (no information).

Pungo Andongo.—A grass 3 to 4 ft. high, with flaccid leaves. Banks of the Calunda stream; Jan. 1857. No. **2715**.

The spikelets in both numbers are blunter than usual in the species.

22. **P. seslerioides** Rendle sp. nov.

Rhizome tough, rounded, whitish in colour, aerial stems slender, erect, leafy to the middle, and ending in a short oblong crowded spike; leaves narrow, suberect, subrigid, blade linear-tapering and like the sheath plicate at the strong midrib; ligule white, membranous, truncate, outer edge ciliate; upper margins of the sheath and upper face of the blade sparsely hairy; spikelets sessile, ovate, generally acute, glabrous, purplish; glume I. ovate, obtuse, with a broad amplexicaul base, submembranous, 3-nerved, scarcely half the length of gl. III.; gls. II. and III. subequal, broadly ovate, subrigid, with 7 rather prominent nerves, II. acute, III. subacute and paleate, containing a ♂ flower; fertile gl. small, colourless, very broadly ovate and blunt, quite smooth, with 5 inconspicuous nerves, enclosing a ♀ flower.

Rhizome 1 to 1⅓ lines in thickness, bearing whorls of roots at its well-marked nodes. Plants 14 to 16 in. high, forming a small tuft of shoots, one of which elongates to bear the spike. Leaf-sheaths narrow, striate, closely appressed to the stem, 1 to 1½ in. long in the radical leaves, reaching 2½ in. in the cauline; blades from 1½ to 6 in. in length, 1½ to scarcely 1 line in greatest width. Spikes ⅔ in. long by ⅕ broad; spikelets 1¾ line long. Glume I. ¾ line long, gl. II. scarcely 1¾ line, gl. III. 1½ line, fertile gl., which is quite concealed within gl. II., only 1 line.

Near *P. indicum*, but distinguished by its striking *Sesleria*-like habit, with its tufts of erect rigid leaves, its long erect scape and short oblong crowded inflorescence.

Huilla.—Nene heights, on the stream; April 1860. No. **2636**.

23. **P. myosuroides** R. Br. Prodr. p. 189 (1810); Steud., *l.c.*, p. 56; Durand and Schinz, *l.c.*, p. 755.

Huilla.—Woody meadows between Lopollo and Catumba; May 1860. No. **2700**. No. **7502** (no information).

24. **P. huillense** Rendle sp. nov.

Plants annual, glabrous, 3 to 6 in. high; radical leaves narrow linear-plicate or with involute margins, sheaths rather broad, and

lax, older ones purplish; ligule membranous, truncate; the single cauline leaf has a narrow closely appressed sheath about equal to the blade which reaches the base of the cylindrical spike; spikelets small, in a densely crowded panicle, ovate or ovate-lanceolate, acute; glume I. $\frac{2}{3}$ of gl. III., broadly ovate, blunt with sheathing membranous edges and 3 well-marked purple veins; gl. II. longer than gl. III., oval with an abruptly acute apex and 5 broad purple veins; gl. III. very broadly oval, acute, 5-veined, enclosing a small barren pale; fertile glume about $\frac{1}{2}$ gl. II., oval, smooth.

Leaves $1\frac{1}{2}$ to $2\frac{3}{4}$ in. long, blade not exceeding $\frac{1}{2}$ line broad, tapering to a point; inflorescence 10 to 15 lines long; spikelets $\frac{3}{4}$ line long. Glume I. $\frac{1}{2}$ line long, gl. II. $\frac{3}{4}$ line, gl. III. $\frac{2}{3}$ line, fertile gl. less than $\frac{1}{2}$ line.

Has somewhat the appearance of a small form of *P. myosuroides*, but is distinguished by the large first glume of the spikelet and the acute second and third glumes.

Huilla.—Poor damp pastures in the Humpata district; April 1860. No. **2699**.

25. **P. catumbense** Rendle sp. nov.

Shoots slender, erect, annual (9 to 12 in.), rising from a perennial woody rhizome from the lower side of which spring numerous wiry roots; basal leaves short, membranous, sheathing; upper ascending, sheaths narrow, terete, closely striate, sparsely pilose, ligule very short, truncate, pilose, blade very narrowly linear-lanceolate, acuminate; inflorescence short ($1\frac{1}{2}$ in.), dense, interrupted, strict, linear or linear-oblong; spikelets laterally compressed, ovate-lanceolate to oval, glabrous, 2 lines long; gl. I. ovate, acute, 7-nerved, $\frac{2}{3}$ length of spikelet; gls. II. and III. equal, strongly nerved, 2 lines long, the second cymbiform, acuminate, the third convex, ovate, acute, subtending a short narrow pale and a ♂ flower; fertile gl. $\frac{5}{6}$ length of two lower ones, broadly ovate, acute.

The short woody nodulose rhizome 1 to 2 lines thick, bears a few crowded young shoots and the charred bases of older ones. Leaf-sheaths closely enveloping and generally exceeding the very slender internodes, 2 to 4 in. long; nodes glabrous. Leaf-blades almost erect, $1\frac{1}{2}$ to $2\frac{1}{2}$ in. long, a little more or a little less than 1 line broad, sparsely pilose on the upper face, the midrib and sometimes the lateral veins, protruding on the lower. Glume I. convex, $1\frac{1}{3}$ line long, 2 outermost nerves short; gl. II. when flattened ovate from a broad truncate base, 9-nerved, barely 2 lines long, gl. III. similar but slightly broader, pale, slender, thin, lanceolate, 1 line long, anthers of flower $\frac{2}{3}$ line long. Fertile gl. subcoriaceous, inconspicuously 3-nerved, $1\frac{1}{4}$ line long, pale of equal length, anthers of ♀ flower $1\frac{1}{4}$ line long (ovary still very small).

Approaches some large-flowered forms of *P. indicum*, but easily distinguished by its habit, interrupted spike, and acute glumes.

Huilla.—Pastures with short overgrowth near Catumba; end of March 1860. No. **2689**.

Sect. 4.—Effusæ (Hook. f. Fl. Brit. Ind. vii. p. 27).

26. **P. arborescens** L. Sp. Pl. p. 59 (1753).

*P. ovalifolium* Poir. Encycl. Suppl. iv. p. 279 (1816); Benth., *l.c.*, p. 561; Steud., *l.c.*, p. 84; Durand & Schinz, *l.c.*, p. 758.

Golungo Alto.—In very shady woods by the river Cuango, but only rarely met with; Dec. 1854. No. **2982**. In rather damp woods, Queta mountains, and also on the banks of the Delamboa river; end of Nov. 1855. No. **7223**. At the public spring in Banza do Bongo Aquitamba; 7 Sept. 1855. No. **7299**. No. **2968** (no information).

27. **P. atrosanguineum** Hochst. ex A. Rich. Tent. Fl. Abyss. ii. p. 375 (1851); Steud., *l.c.*; Durand & Schinz, *l.c.*, p. 741.

Pungo Andongo.—Muta Lucala. No. **2722**. An annual grass, diffusely cæspitose, a span or a foot high, when alive a bright green, spikelets generally purplish, seeds shiny-black. Cattle are fond of it. Plentiful in rather damp muddy-sandy meadows at the river Luxillo, between Pungo Andongo and Cambambe; April 1857. No. **7418**. An annual species, of graceful habit and supplying excellent fodder for cattle. In rather damp sandy places at the river Luxillo; April 1857. Coll. Carp. 1088.

28. **P. hirsutulum** Rendle sp. nov.

Annual, shoots hairy, sparsely cæspitose, very slender, erect or oblique, unbranched; leaves linear, tapering at both ends, very acute; panicles lax, terminal and axillary; spikelets solitary, long-stalked, hairy, 1 line long, with divergent acute glumes; barren glumes broadly ovate, 5-nerved, gl. I. slightly less than gl. II., gl. III. blunter with an equal pale and a minute aborted male flower; fertile gl. shorter, oval, white, smooth, and polished.

Shoots 10 to 20 in. high, covered from base to apex with soft spreading whitish hairs. Internodes very slender, $\frac{1}{4}$ to scarcely $\frac{1}{2}$ line in diameter, $1\frac{1}{2}$ to 5 in. long. Sheaths short, about 1 in., closely investing the internode, striate, scabridulous; ligule very short pilose; blades 2 to 4 in. long by 1 to $1\frac{1}{2}$ lines broad, sometimes smaller at the upper nodes, flat, scabridulous-hairy on both surfaces, apex finely pointed. Panicles rather small, lax-flowered, 3 to 6 in. long, terminating the axis and springing from the axils of the leaves, rhachis slender, branches scattered, spreading or ascending, spikelets spreading, sometimes pendulous, greenish, sometimes stained with purple. Glume I. $\frac{2}{3}$ to 1 line long, acute, with 5 prominent green nerves, the 2 outer shorter, bearing on the back long stiffish white hairs; gl. II. 1 to $1\frac{1}{4}$ line, with 5 prominent green nerves and hairy on the back; gl. III. 1 line long, more membranous than the two preceding, with less conspicuous nerves and a few short hairs on the upper part; pale 1 line long, including 3 minute aborted stamens at the base; fertile gl. $\frac{3}{4}$ line.

Near *P. atrosanguineum* Hochst., but distinguished by its more acute glumes, its gracile habit with numerous lateral

panicles, and its pilose panicle and spikelets. The habit is somewhat that of *P. humile* Nees, but the shoots are less spreading and the spikelets larger and more distant.

Pungo Andongo.—An annual grass, a foot high, erect, branched, with subpendulous hispidulous spikelets. Very rare by springs in high rocky places of the præsidium near Quilombo; end of April 1857. No. **2824**. Also seen near Quilanga but not fully grown. A slender annual *Panicum*-like grass; culms sparsely cæspitose, rather flaccid, very slender, erect or oblique; spikelets greenish. In wooded places by the banks of the river Luxillo between Pungo Andongo and Cambambe; May 1857. No. **7421**.

29. **P. pansum** Rendle sp. nov.

Annual, cæspitose, shoots erect from an ascending base; leaves ascending, hairy, linear-tapering, acute from a markedly striate sheath; panicle very large, much-branched, branches long, ascending, spikelets solitary or in distant pairs, oval or oblong-oval, shortly acute, 1 line long; lowest barren glume ovate, acute, loosely embracing the base of the two higher and about $\frac{3}{4}$ their length, incompletely 3-nerved, gls. II. and III. ovate, subequal, and similar, 5- to 7-nerved, the latter with a short barren pale; fertile gl. slightly shorter, suboval, coriaceous, with smooth rounded back and a similar equal pale.

Strong-growing plants with a tufted growth, 3 ft. high; internodes in the stronger shoots 4 to $4\frac{1}{2}$ in. long, about $1\frac{1}{2}$ line in diameter; nodes dark, glabrous. Sheaths $1\frac{1}{2}$ lines broad at the base of the shoots, $\frac{1}{5}$ to $\frac{1}{4}$ less than the smooth internodes; upper portion and margins hairy, sometimes scabrid. Blade 3 to 8 in. long by $2\frac{1}{2}$ to 3 lines greatest breadth, flat, lower face with prominent scabrid-hairy veins, margin and upper face also hairy; ligule short, breaking up into a ridge of short grey hairs. Panicle rather lax, 1 to $1\frac{3}{4}$ ft., branches solitary or in pairs, branchlets slender, flexuose, spikelets often long-stalked, of a shining gold colour. Barren glumes membranous, the lowest shortly acute, $\frac{3}{4}$ to 1 line long, separated from the upper by a short internode; gl. II. 1 to $1\frac{1}{4}$ line long, generally slightly longer than gl. III. (1 line), both broadly ovate, obtuse, or with margins incurved at the tip, forming a short point, pale of gl. III. about half its length. Fertile gl. $\frac{4}{5}$ line long, ovately-oval or almost oval, indistinctly 5-nerved, yellow to a dirty brown in colour.

The spikelet closely resembles that of *P. atrosanguineum*, but the whole character of the plant and its large much-branched lax panicle at once distinguish it. The grain is also broader and lighter in colour.

Golungo Alto.—An annual grass, cæspitose, ascending, panicle 1 to $1\frac{3}{4}$ ft., rather lax and very much branched, spikelets solitary, shining-gold. By the road in sandy sunny places between Cambondo and Luinha, plentiful but seen only in this place; 10 June 1855. No. **7261**. Coll. Carp. 1090.

Pungo Andongo.—In sandy woods between Candumba and Lombe; March 1857. No. **2832**.

30. **P. coloratum** L. Mant. p. 30 (1767).

Var. **strictum** Rendle var. nov.

Differs from the species in its stricter panicle and more rigid spikelets, with a very blunt often truncate outermost barren glume.

Huilla.—Rather damp clayey wooded meadows near Catumba; end of March 1860. No. **2688.**

Var. **cuanzense** Rendle var. nov.

A laxer plant with a larger panicle and slightly smaller less rigid spikelets than in the species. The structure of the spikelets resembles that of the latter too closely to allow of its specific separation. I have therefore adopted Welwitsch's ms. name, reducing it to varietal rank.

Loanda?—No. **7355** (no information).

Pungo Andongo.—Annual; culms sparsely and laxly cæspitose, erect, panicle effuse, much branched. In rather damp sandy places at the great cataract of the river Cuanza near Condo; March 1857. No. **2833.** Coll. Carp. 1083.

31. **P. subrepandum** Rendle sp. nov.

Perennial, shoots slender, erect, unbranched, or rarely with a short leafy branch at the base, leaves suberect, narrow-linear, acute; panicle effuse, lax-flowered with rhomboidal or ovate outline, spikelets ovate, $1\frac{1}{4}$ to $1\frac{1}{3}$ line long; gl. I. reaching to about $\frac{2}{3}$ the length of the spikelet, broadly oval, blunt, 3-nerved, gls. II. and III. equal, 5-nerved, the former with a broadly-rounded back, and suborbicular when flattened, the latter forming a hood with broad translucent margins and sheltering a pale and a ♂ flower; fertile gl. whitish, subcoriaceous, convex, covered with large warts, as is also the back of the pale.

Shoots 18 to 22 in. long, glabrous, crowded on a thin knotted rhizome with slender wiry roots. Internodes 1 to 3 in. long, slender, terete, striate; nodes smooth, glabrous. Sheaths narrow, striate with minutely ciliate margins, completely enveloping the lower internodes, about $\frac{2}{3}$ the length of the one below the inflorescence; ligule short, truncate, brown, membranous, shortly fimbriate; blade $2\frac{1}{2}$ to 4 in. long, by $1\frac{1}{4}$ line or less in width, midrib conspicuous below. Panicle $3\frac{1}{2}$ to 4 in. long on a stalk 8 to 12 in.; branches alternate, spreading at an angle of about 45° and bearing filiform subspreading branchlets, which again branch and bear the subdistant long and shortly-stalked spikelets. Glume I. barely 1 line long, broadly oval to suborbicular, edges broad, translucent; gl. II. $1\frac{1}{6}$ line long, with rounded incurving edges, giving a broadly oval outline and a bluntly apiculate apex; gl. III. broader, pale oval when in position with broad edges sharply infolded at the strong converging nerves. Fertile gl. enveloped by the second barren glume, $\frac{4}{5}$ to $\frac{7}{8}$ line long, suborbicular when flattened, 5-nerved; pale oval in outline except for the broadly overlapping sides.

Near *P. natalense* Hochst., which is distinguished by its long rigid convolute leaves, more strongly nerved glumes, and the absence of the large warts on the fertile glume and pale.

Huilla.—In bush-grown wooded places at Monino ; April 1860. No. **2686**.

32. **P. gracilicaule** Rendle sp. nov.

Annual, cæspitose, glabrescent, shoots slender, branching, ascending to erect, sometimes geniculately decumbent below ; leaves short, linear-tapering, acute, spreading to suberect ; panicle as in last species but smaller ; spikelets glabrous, oval to ovate, 1 line long ; glume I. reaching about $\frac{2}{3}$ length of spikelet, broadly ovate, blunt, incompletely 3-nerved ; gl. II. slightly longer than gl. III., broadly ovate, blunt, 5-nerved, very convex ; gl. III. somewhat similar but broader than gl. II. with broad translucent margins, sheltering an ovate pale with a ♂ flower ; fertile gl. small, thinly coriaceous, suborbicular with a blunt apex, bearing on the outside numerous white warts ; pale subequal similarly warted.

A graceful plant ; shoots subglabrous, 9 to 16 in. long, crowded at the base. Internodes very slender, terete, $1\frac{1}{2}$ to $2\frac{1}{2}$ in. long ; nodes glabrous. Sheaths narrow, subcompressed, striate with minutely ciliate edges, about half the length of the internodes ; ligule forming a row of stiff erect white hairs $\frac{1}{2}$ line long ; blade $1\frac{1}{2}$ to $2\frac{1}{4}$ in. long by nearly 2 lines broad, thin, veining inconspicuous, surface glabrous or minutely and sparsely hairy. Inflorescence resembling that of the last species but the panicle only from $2\frac{1}{2}$ to 3 in. long ; spikelets glabrous. Glume I. $\frac{3}{4}$ line long, edges broad and translucent ; gl. II. 1 line ; gl. III. scarcely 1 line, thinly membranous, suborbicular when flattened, pale $\frac{4}{5}$ line, anthers light brown, $\frac{3}{4}$ line long. Fertile gl. $\frac{1}{2}$ to $\frac{2}{3}$ line, 5-nerved, pale subequal, broadly oval, enfolding a ♀ flower.

Near *P. subrepandum*, but a smaller more delicate plant, with smaller spikelets, which are also distinguished by the ovate lowest glume and the very small fertile flower.

Pungo Andongo.—Nos. **2857**, **2862***e* (no information).

Huilla.—Wooded meadows near Humpata, found in many places but almost destroyed by the fires of the Monanensian war ; April 1860. No. **2687**.

Also collected in Gambia by Mungo Park.

33. **P. Beccabunga** Rendle sp. nov.

A small glabrous herb with stems creeping and rooting at the nodes, ultimately decumbent ; internodes short, leaf-sheaths $\frac{1}{3}$ to $\frac{1}{2}$ their length, ligule reduced to a very narrow membranous ridge, blades short, narrowly ovate to lanceolate, with a rounded amplexicaul base and acute apex ; panicle very small, ovate to oval, branches few, ascending-rigidulous, pedicels short, spikelets ellipsoid ; barren glumes submembranous, blunt, the outermost subovately oval, 3-nerved, blunt, $\frac{3}{4}$ the length of the spikelet, gl. II. oval, 5-nerved, slightly exceeding gl. III., which is oblong-oval, with membranous incurving edges, and subtends a narrower oblong pale ; fertile gl. coriaceous, broadly oval, polished, whitish.

Shoots a foot, or generally more, in length, internodes terete, about $\frac{3}{4}$ in. long, becoming a little shorter above, less than $\frac{1}{2}$ line in

diameter, the lower clothed for about $\frac{1}{3}$ the length with the leaf-sheath or its remains; leaf-blades flat, 6 to 7 lines long by a little over 2 lines broad, more or less spreading. Panicle $\frac{1}{2}$ to $\frac{3}{4}$ in. long, spikelets barely 1 line. Glume I. $\frac{2}{3}$ line, gl. II. $\frac{4}{5}$ line, gl. III. $\frac{3}{4}$ line with a pale about $\frac{2}{3}$ its length, fertile gl. $\frac{2}{3}$ line.

Is near the tropical South American *P. parvifolium* Lam., but distinguished by its ovate leaves and smaller dense panicle. It recalls *P. pusillum* Hook. f. (Cameroons) in habit, but is a larger, stronger plant. *P. pusillum*, moreover, has acute sparsely hairy spikelets.

Huilla.—By cold streams in the heights of Morro de Monino, but only growing sparsely; May 1860. No. **2694**.

34. **P. strictissimum** Afzel. ex Swartz Adnot. Bot. p. 4 (1829).

Pungo Andongo.—In marshes between Mangue and Mutollo; March 1857. No. **7427**. No. **2870** (no information).

35. **P. Frederici** Rendle sp. nov.

Cæspitose, apparently perennial; stems branching at the base only, erect, or geniculate at the lower nodes, slender, terete, glabrous; leaves subrigid, erect or ascending, narrow-linear, tapering gradually to an acute tip, glabrous except for a few scattered white hairs at the base of the blade, sometimes with involute margins and subulate-filiform; ligule short, truncate, membranous; sheath appressed, generally shorter than the internode; panicle effuse, ovate or ovate-elliptical, branches capillary, flexuose; spikelets long-stalked, small, roundish, the two barren outer glumes subequal, bearing soft white hairs, bluntly ovate, the lower 3-nerved, the upper 5-nerved; gl. III. large, slightly exceeding gls. I. and II., blunt, orbicular, subcoriaceous, 5-nerved, enclosing a large, subequal pale and a male flower, gl. IV. $\frac{2}{3}$ the length of gl. II., broadly ovate or suborbicular, enerved.

An elegant plant 1 to 4 ft. high (some very slender starved specimens only 6 to 9 in.). Veins of leaf prominent on the back, sheaths striate with well-marked midrib, sometimes almost keeled; blade generally 3 to 6 in. long, by 1 line or less in width, sometimes longer in the subulate-filiform leaves. Panicle overtopping the leaves, 3 to 6 in. long, primary branches generally spreading at about 45°; spikelets $\frac{3}{4}$ to $\frac{4}{5}$ line long, greenish; gl. IV. enclosing a similar but slightly smaller pale and ♀ flower.

Near *P. gracillimum* K. Schum. in Engl. Bot. Jahrb. xxiv. 331 (e descript.) but distinguished by its blunter glumes, proportionately longer gl. III., membranous glabrous ligule, etc.

Pungo Andongo.—A very graceful grass 3 to 4 ft. high, with the habit of *Panicum tenellum*. In damp meadows between Condo and Quisonde; March 1857. No. **7410**. An elegant grass 1 ft. high. In thicket-grown rather spongy pastures between Pungo Andongo and Cambambe; May 1857. No. **7422**. A graceful grass (perennial?) with the habit of a *Panicum*, cæspitose with bright green spikelets. In the dried up lake of Quibinda; March 1857. No. **7432**. Nos. **2850** (small starved specimens), **2872**, **2874** (no information).

HUILLA.—In damp pastures growing with *Eriocaulon*; Dec. 1859 No. **2671**.

Var. **minor** Rendle var. nov.

Small erect graceful plants 10 to 12 in. high, with bluish spikelets $\frac{1}{2}$ to $\frac{2}{3}$ line long.

36. **P. maximum** Jacq. Icon. Pl. Rar. i. t. 13 (1781); Benth., *l.c.*, p. 560; Steud., *l.c.*, p. 72; Durand & Schinz, *l.c.*, p. 753.

BARRA DO BENGO.—An erect perennial (?) sparingly cæspitose and narrowly leaved; culms $2\frac{1}{2}$ to 3 ft., more or less straight, with long hairs at the nodes; sheaths always hairy; spikelets dull purple. Rather rare in dampish sandy mud near Cacuaco; Jan. 1854. No. **7286**.

LOANDA.—1853-4. Nos. **7362**, **7362***b*.

GOLUNGO ALTO.—Grows sparsely by edges of woods in places thinly covered with grass near Calôlo; Sept. 1854. No. **2990**. A perennial (?) grass, erect, 4 to 8 ft. high; the stem, from the base almost to the middle, bearing stinging hairs. In rather damp places by the river Quiapoze in the Bumba district; May 1855. No. **7187**. Nos. **7239**, **7240** (no information). A tall species of *Panicum* liked by cattle, with red and green spikelets. Molembas; middle of June 1855. COLL. CARP. 1087.

PUNGO ANDONGO ?—No. **2863** (no information).

Welwitsch, in a letter dated Oct. 1869, states that this is one of the grasses known as Capim d'Angola.

37. **P. repens** L. Sp. Pl. ed. ii. p. 87 (1762); Durand & Schinz, *l.c.*, p. 760.

*P. ischaemoides* Retz. Obs. iv. p. 17 (1786). *P. proliferum* Lam. Encycl. iv. p. 747 (1795-6). *P. arenarium* Brot. Fl. Lusit. i. p. 82 (1804); Benth., *l.c.*; Steud., *l.c.*, p. 73.

HUILLA.—On nearly dried up banks of rivers, Lopollo; May 1860. No. **2674**.

38. **P. trypheron** Schult. Mant. ii. p. 244 (1824).

PUNGO ANDONGO.—In sandy wooded meadows at the banks of the river Cuanza, near Lombe; March 1857. No. **2815**. Nos. **2842**, **2868** (no information).

Var. **giganteum** Rendle var. nov.

A tall erect plant, 4 to 5 ft. high, with long tapering glabrous or hirsute leaves more than 2 ft. long (excluding the sheath) and reaching $\frac{1}{2}$ in. in width. Panicle 1 to nearly 2 ft. long, contracted or spreading. Spikelets as in the type, but a male flower is present in the pale of the third glume.

A fine plant with the habit of *P. virgatum* L. but the spikelets are smaller, and except for the presence of a ♂ flower in gl. III., indistinguishable from those of the Indian specimens of the type.

GOLUNGO ALTO.—In rather damp low-lying thickets near Camilungo; May 1856. No. **7213**.

PUNGO ANDONGO.—A grass 4 to 5 ft., erect, with broad leaves and narrow crowded panicle. In dense primæval woods between Calundo and Pedras de Guinga; March 1857. No. **7434**. Gravelly places near Ponte do Luiz Simões; May 1855. No. **7254**.

39. **P. graciliflorum** Rendle sp. nov.

Perennial (?) erect, shoots long and branching, spreading from

a crowded base, geniculate at the lower nodes; leaves linear with a long tapering finely-pointed apex; panicle large, diffuse, much-branched, branches slender to capillary, spikelets purple, distant, long-stalked, with divergent acute glumes; glume I. ovate, midrib strong, subcarinate and produced into a short stiff awn; gl. II. ovate, acuminate, slightly exceeding the other two; gl. III. broadly ovate, blunt, with a pale and a male flower; fertile gl. shorter than the barren, oval-oblong in outline in its natural position, coriaceous, whitish, polished.

The long glabrous spreading shoots (to $2\frac{1}{2}$ ft.) are crowded at the base apparently on a rhizome (broken off short in the specimen); short stiff roots spring from their bases. Internodes long, slender, rounded, smooth; nodes glabrous; sheaths $\frac{1}{2}$ to $\frac{2}{3}$ length of internodes, striate, appressed, with a minutely ciliate margin; in the lower part of the shoots loose and membranous after withering of blade; ligule short, membranous, fimbriate; blades 6 to 10 in. long by 2 lines or less in breadth, rather stiff, midrib very prominent on the lower face, margins becoming revolute. Panicle ovate, 8 in. long, branches widely spreading, pedicels 2 to 4 times the length of the spikelet. Glume I. $1\frac{1}{5}$ to $1\frac{1}{4}$ line long, incompletely 5-nerved, midrib scabridulous on the back like the awn, lateral nerves weak, successively shorter; gl. II. convex, $1\frac{1}{5}$ to $1\frac{1}{3}$ line, shortly acuminate, with 3 strong nerves converging at the apex and a pair of weak incomplete outer nerves; gl. III. convex, 1 to $1\frac{1}{5}$ line, broader than the second, 5-nerved, 2 outer nerves weak and ending below the apex; pale strongly ribbed, broadly ovate, with broad infolded margins, 1 line long, anthers dark-coloured. Fertile gl. $\frac{3}{4}$ line long, very broadly oval when the strongly incurved edges are opened out, inconspicuously 5-nerved; pale subequal.

Golungo Alto.—A monocarpic grass, spikelets obscurely violet, distant. Rather rare in sunny sandy places between Cambondo and Trombete; 20 June 1855. No. **2959**.

Is near *P. trypheron* Schult., but distinguished by its delicate diffuse panicle, with smaller spikelets. From the description given by Steudel is apparently allied to his *P. anabaptistum* (*l.c.*, p. 75), collected by Leprieur in Senegal.

Evidently a widely diffused species in tropical Africa, as the following specimens are referable to it. Hildebrandt No. 1186 and No. 1087, Zanzibar; Holst No. 3120, Usambara; and one from Christian Smith, Congo.

40. **P. madagascariense** Spreng. Syst. i. p. 317 (1825); Steud., *l.c.*, p. 85; Durand & Schinz, *l.c.*, p. 753.

*P. airoides* Flügge ex Nees in Mart. Fl. Bras. ed. i. ii., p. 175 (1829).

Mossamedes.—A grass, apparently sometimes annual, sometimes perennial, with leaves and stems glaucous in the living state. Common on the sandy banks of the river Bero in the coast region; July and

Aug. 1859. No. **2596**. On the sandy banks of the river Bero, now almost entirely dried up; July 1859. No. **2614**. An annual grass, scarcely a span high, erect, branched from the base; culms smooth, long-sheathed, branchlets generally secund, spikes contracted ovate-lanceolate, greenish red. Rather rare in submaritime sandy places at Saco do Giraûl; in fl. 19 July 1859. No. **2616**. A widely-spreading pleasing grass, glaucous, a span high, with lax spreading panicles. Banks of river Bero; Aug. 1859. Coll. Carp. 1114.

Loanda.—1853-4. No. **7378**.

The specimens from Loanda resemble those from Madagascar, having rather tall elongated shoots, with a large diffuse panicle. Those from Mossamedes are, as we might expect from their psammophilous habit, low-growing, with a number of shorter decumbent shoots spreading from the rooting nodes of the rhizome; the panicle is also much smaller and very dense.

Var. **brevispiculum** Rendle var. nov.

Distinguished by its smaller and more delicate inflorescence, smaller spikelets, and invariably truncate barren glumes.

Loanda.—In sandy places among mandioc plantations and also ubiquitous in uncultivated places. Museque do Luiz Gomes; April 1854. No. **7290**. Habit of *Aira* and *Agrostis*. Common in gravelly places on Cazanga Island and almost always in flower; April and May 1854. No. **7297**. A grass with the habit of *Agrostis*, apparently bi- to tri-ennial, root fibrous, multicaulescent, culms 1 to 2 ft., radiately decumbent-ascending, very tough. Colour of flowers, violet. Very common in gravelly places, in fields and between rows of mandioc in the south plain beyond Loanda: in fl. 10 Jan. 1858. No. **7297***b*. In gravelly soil, mandioc plantations near Museque do Luiz Gomes; March 1854. No. **7457**. Ilha de Cazanga; 30 April 1854. Coll. Carp. 1097 (Masango mendo). 1853-4. Nos. **7379**, **7380**, **7381**, **7383**. No. **2907** (no information).

41. **P. trichoides** Sw. Prodr. p. 24 (1788).

Golungo Alto ?—No. **2962** (no information).

Agrees with the type of the species which is Sloan. Jam., p. 115 t. 72 f. 3; the plant figured by Sloane occurs in his herbarium, at the British Museum.

Sect 5.—Gibbosæ (Hook. f. Fl. Brit. Ind. vii. p. 28).

42. **P. patens** L. Sp. Pl. p. 58 (1753).

*P. radicans* Retz. Obs. iv. p. 18 (1786). *P. setigerum* Beauv. Fl. Owar. i. p. 82, t. 49 (1806-7).

Golungo Alto.—An elegant very graceful grass with cæspitose growth. In the shade of primitive woods, Monte de Queta. Mata de Mangues; May 1856. No. **7210**. In shady woods on mountains of Alto Queta; end of May 1855. No. **7263**. Cæspitose graceful panicles with subverticillate nodding branches. Shady places on Alto Queta: June 1855. Coll. Carp. 1086.

Differs from the Asiatic form only in its long-haired spikelets.

Sect. 6.—Pseudechinolæna (Hook. f., *l.c.*, p. 58).

43. **P. uncinatum** Raddi Agrost. Bras. p. 41 (1823); Steud., *l.c.*, p. 50.

Golungo Alto.—Woody grassy places, Cungulungulo; April 1856. No. **7202.**

Pungo Andongo.—No. **2878** (no notes).

The following may belong to this genus:—

Golungo Alto.—A grass almost with the habit of a *Commelina* when alive, growing in dense clusters on the herbage-covered banks of the river Canaballa, but unhappily never yet found in flower. In marshy meadows on the right of the river Canaballa, Sobato de Bumba; Oct. 1855. No. **7192.**

23. **AXONOPUS** Beauv. Agrost. p. 12 (1812).

*Panicum* L., Benth. & Hook. f. Gen. Pl. iii. p. 1101, pro parte.

1. **A. semialatus** Hook. f. Fl. Brit. Ind. vii. p. 64 (1896).

*Panicum semialatum* R. Br. Prod. p. 192 (1810). Var. *Ecklonianum* Hack. apud Durand & Schinz, Consp. Fl. Afr. v. p. 764. *Bluffia Ecklioniana* Nees in Lindl. Nat. Syst. ed. ii. p. 447 (1836).

Huilla.—In damp elevated thicket-grown pastures on the plain called Empalanca; May 1860. No. **2668.**

24. **OPLISMENUS** Beauv.; Benth. & Hook. f. Gen. Pl. iii. p. 1104.

1. **O. undulatifolius** Beauv. Agrost. p. 54 (1812).

Golungo Alto.—Very plentiful in shady woods on the rivers Quiapose, Cuango, etc., very densely cæspitose, flowering somewhat rarely. At the cataract of Isidro near Canguerasange; in fl. Oct. 1854. No. **7186.** In grassy wooded places Cungulungulo; April 1856. No. **7199.** In rather damp herbage in woods of Cungulungulo; April 1856. No. **7200.**

Pungo Andongo.—A creeping grass, growing in shady places. Shady woods between the præsidium and Luxillo; April and May 1857. No. **7391.**

2. **O. compositus** Beauv., *l.c.*; Durand & Schinz, Consp. Fl. Afr. v. p. 771.

*O. elatior*, *hirtellus*, *loliaceus* (*errore foliaceus*) Beauv., *l.c.* *Orthopogon compositus* R. Br. Prod. p. 194 (1810). *Panicum compositum* L. Sp. Pl. 57 (1753); Steud. Syn. Pl. Gram. p. 44. *P. hirtellum* L. Amoen. Acad. v. p. 391 (1760); *P. elatius* Linn. f. Suppl. p. 107 (1781).

Prince's Island.—In shady woods on the Pico de Papagaio at about 1000 ft. altitude; Sept. 1853. No. **2926.**

Island of St. Thomas.—Monte Caffé; Dec. 1860. No. **2886.**

Has the spikelets crowded and secund, and is the form generally known as *O. loliaceus* Beauv.

3. **O. africanus** Beauv. Fl. Owar. ii. p. 15, t. 68, f. 1 (1810); Durand & Schinz, *l.c.*, p. 771.

*O. Burmannii*, Beauv. Agrost., *l.c.*; Durand & Schinz, *l.c.* *O. bromoides* Beauv., *l.c.* *O. multisetus* A. Rich. Tent. Fl. Abyss. ii. p. 377 (1851). *Panicum Burmanni* Retz. Obs. iii. p. 10 (1783). *P. bromoides* Lam. Ill. p. 170 (1791), Encycl. iv. 732 (1795-6).

Golungo Alto.—In grassy wooded places at Cungulungulo; April 1856. No. **7203**. A cæspitose grass, with procumbent rooting stem; culms flaccid, somewhat nodding when mature; leaves more or less undulate. In rather damp palm country, near the base of Monte Queta, to the left of the river Cuango; not plentiful; July 1855. No. **7252**. In maize-fields near Sange (Arimo do Mariano); end of August 1855. No. **3003**.

Huilla.—Culms very laxly cæspitose, decumbent. In shady wooded places on the river Monino, but not at all plentiful; April 1860. No. **2696**.

25. **SETARIA** Beauv.; Benth. & Hook. f. Gen. Pl. iii. p. 1105.

1. **S. glauca** Beauv. Agrost. p. 51 (1812); Durand & Schinz, Consp. Fl. Afr. v. p. 773.

*Panicum glaucum* var. γ. L. Sp. Pl. p. 56 (1753). *P. glaucum* L. Syst. Nat. ed. x. p. 870 (1759); Steud. Syn. Pl. Gram. p. 50 (1854).

Golungo Alto. — Panicoid, very like the European species of *Setaria*, cæspitose, annual, very quickly disappearing. In places which have been cultivated and abandoned, and in sunny sandy-clayey places near Sange; Jan. 1855. No. **2980**. Cæspitose in sunny sparsely grassy places near Canañlo (Caminho d'Ambaca); April 1855. No. **7204**. Not plentiful in sunny, sparsely grassy places and in abandoned fields round Canañlo and Camilungo; very quickly disappears; Jan. 1855. No. **7233**.

Pungo Andongo.—Luxillo; end of April 1857. No. **2736**. Plentiful in sandy places with short grass, near Ponte de Luxillo; Jan. 1857. No. **2738**. In wooded meadows in the præsidium; Feb. and March 1857. No. **2788**.

Huilla.—Plentiful in pastures grown with short thicket in the Lopollo district; Feb. 1860. No. **2683**. Edges of maize fields near Nene; April 1860. No. **2684**.

2. **S. verticillata** Beauv., *l.c.*; Durand & Schinz, *l.c.*, p. 774.

*Panicum verticillatum* L. Sp. Pl. ed ii. p. 82 (1762); Steud., *l.c.*, p. 52.

Golungo Alto.—Among reeds and in places once cultivated, now covered with tall grasses, but not plentiful, near Arimo do Isidro; Feb. 1855. No. **2979**. An annual grass, ascending or erect, a great nuisance to farmers. In places no longer cultivated between Sange and Ambaca; very plentiful in certain spots; May 1856. No. **7212**. An annual grass, widely creeping, almost climbing, sticking closely to surrounding objects by means of the reversed barbs on the setæ of the spikelets. In places no longer cultivated among mandioc plantations, etc., around Sange and Bango; July 1855. No. **7266**. No. **7231** (no information).

Mossamedes.—In sandy thickets near the river Bero, or Rio dos mortes; Aug. 1859. No. **2293**. In sandy thickets on the river Bero, Mata dos Carpinteiros; Aug. 1859. No. **2293*b***.

3. **S. Welwitschii** Rendle sp. nov.

Erect apparently widely branching strong-growing culms

with narrow linear-lanceolate or linear-tapering flattened scabridulous sometimes hairy leaves; panicle spiciform and narrowly cylindrical or subpyramidal to lanceolate in outline, spikelets 1 line long, ovately oval, subplano-convex, glabrous, densely crowded on the short branches which end in a rather long and strong flexuose seta, one or a few shorter weaker setæ spring from below each spikelet; barbs on the setæ ascending; barren glumes membranous, colourless between the well-marked green veins; gl. I. scarcely half the length of the spikelet, suborbicular with an abruptly shortly apiculate apex, 3-nerved; gl. II. broadly oval, with a broadly rounded back, 5-nerved; gl. III. similar but a shade longer, blunt and flatter, subtending an equal flat pale and a ♂ flower; fertile gl. oval, shorter than the second and third barren glumes, coriaceous, convex, minutely transversely rugulose.

The plants, according to a note of Welwitsch, reach 4 to 6 ft. in height. The larger specimens have a short culm, with subcompressed internodes 1 to 2 in. long, and $1\frac{1}{2}$ to 2 lines wide; from the nodes spring densely branching lateral shoots. Internodes stramineous, striate, glabrous like the nodes. Sheaths, except the few uppermost, exceeding the internodes, rather loose, submembranous, the upper narrow and closely embracing the internodes, glabrous or tuberculo-pilose especially near the mouth; ligule a fringe of hairs $\frac{5}{4}$ line long; blade tapering to a long fine point, 2 to 12 in. long by $1\frac{1}{2}$ to 3, or rarely nearly 4 lines broad. Panicle from less than 1 in. to $5\frac{1}{2}$ in. long, and 2 lines to 1 in. across, rhachis and branches shortly hairy; in the lower part of the larger inflorescences the short branches reach $\frac{1}{2}$ to $\frac{2}{3}$ in. Glume I. from a little over $\frac{1}{10}$ to $\frac{1}{5}$ line long, closely embracing the base of the spikelet; gl. II. $\frac{2}{3}$ line long, 5-nerved becoming 7-nerved below the very bluntly apiculate apex; gl. III. $\frac{4}{5}$ line long. Fertile gl. $\frac{2}{3}$ line, inconspicuously 3-nerved, 5-nerved above; pale subequal of similar consistence.

Near *S. verticillata* Beauv., but distinguished by its large second barren glume, completely covering the smaller fertile glume; also by the ascending not reversed barbs of the setæ.

Ambriz.—Nov. 1853. Nos. **2891**, **2895**.

Loanda.—A widely cæspitose panicoid grass, with graceful spikes $1\frac{1}{2}$ in. long. In grassy places between Penedo and Conceiçao; Jan. 1859. No. **2914**. Journey to Quicuxe; April 1854. No. **7307**. 1853-4. No. **7370**. No. **2913** (no information).

Mossamedes.—A grass 4 to 6 ft., with a branched erect culm. On the marshy sandy banks of the river Maiombo, near Pedra do Rei; Oct. 1859. No. **7508**.

4. **S. paniciformis** Rendle sp. nov.

Apparently perennial, from a tough slender rhizome; shoots tufted, subspreading, slender, simple or branched; leaves long, narrow, acute, tapering gradually to both ends, flat, subplicate at the base; panicle dense, narrow lanceolate in outline, spikelets subsessile on the short ascending branches, or very short branch-

lets, ovately-oval, subpungent, oblique, scarcely 1 line long; glume I. short, subgibbous, 3-nerved, a little more than $\frac{1}{3}$ the length of the spikelet; gls. II. and III. broadly ovate, 5-nerved, shortly acute, the latter larger and subtending an equal pale with a ♂ flower; fertile gl. slightly shorter than gl. III., coriaceous, transversely rugulose, strongly convex, light brown.

Shoots 2 to $2\frac{5}{4}$ ft. long, geniculate at lower nodes; internodes long, stiff, slender, terete, polished; nodes well-marked, brown. Sheaths stiff, loose, often longer than the lower internodes, but shorter, often much shorter than the upper, striate, glabrous, ciliate at the mouth, with minutely ciliate margins when young; ligule a dense row of short hairs; lamina thin with subprominent light-coloured midrib and 3 lateral veins on each side, upper face and margins minutely scabridulous, veins pilosulose on the lower face, apex drawn out to a fine point, 5 to 10 in. long, 2 to $3\frac{1}{5}$ lines greatest width. Panicles 4 to 6 in. long, generally $\frac{3}{4}$ to $1\frac{1}{2}$ in. broad; branches generally about 1 in. long (rarely 2 in.) below, becoming shorter as we ascend; the longer ones bearing short branchlets below. Spikelets reddish-green on very short pedicels, which bear a single hair-like seta slightly exceeding or 2 to 3 times the length of the spikelet. Glumes shortly and abruptly acute, except the fertile membranous; gl. I. ovate-orbicular, $\frac{2}{5}$ line long; gl. II. very broadly shortly ovate, $\frac{1}{2}$ line long; gl. III. broadly convex below, converging above to the short acumen, pale large, flat, suboblong. Fertile gl. $\frac{3}{4}$ to $\frac{4}{5}$ line long, oval or ovately oval in outline when in natural position, faintly 5-nerved.

Distinguished from the narrow-leaved varieties of *S. mauritiana* by its smaller, more ovate spikelets, and non-plicate leaves.

Pungo Andongo.—Woody thickets between the præsidium and Luxillo; middle of Dec. 1856. No. **2753**. Dec. 1856. Nos. **2764** and **2764***b*; No. **2858** (no information).

Prince's Island.—A cæspitose grass, polymorphous according to the stage of development and condition of soil. In gravelly places near the stream, growing with ferns not far from the sea. Evidently an emaciated form of the same species as the Pungo Andongo plants.

A very similar plant was collected by Don in St. Thomas' Island.

5. **S. mauritiana** Spreng. Syst. i. p. 305 (1825).

*Panicum palmæfolium* Koen. in Naturforsch. xxiii. p. 208 (1788).

*P. plicatum* Lam. Ill. p. 171 (1791); Benth. in Hook. Niger Fl. p. 561 (1849); Durand & Schinz, *l.c.*, p. 759. *P. mauritianum* Willd. ex Spreng., *l.c.*

Prince's Island.—A very fine grass, cæspitose, with stems frequently 5, or even 6 ft., generally 4 ft. high. Common in dense primitive woods near streams at the foot of Pico de Papagaio; Sept. 1853. No. **2933**.

Golungo Alto.—A gigantic grass, 6 to 9 ft., very beautiful on account of its very broad longitudinally plicate leaves, worthy to be classed among the ornamental plants of tropical Africa, extremely varied in breadth and hairiness of leaf. Plentiful in shady rather damp places, especially near streams, in the whole district of Golungo.

At the stream Capopa; Dec. 1854. No. **7257**. A narrow-leaved form, with sparsely hairy culm, and very acuminate leaf-apex. Plentiful at the banks of the river Cuango, near Sange; end of Sept. 1854. No. **7258**. Cungulungulo, Montalegra; Feb. 1855. No. **7176**. Nos. **3001**, **7228***b* (no information)

Var. **angustifolia** Rendle var. nov.

Leaves 6 to 12 in. long by 2 to 4 lines broad, tapering gradually towards both ends, apex drawn out to a long fine point; panicle narrow, dense, 4 to 9 in. long, $\frac{1}{2}$ to 1 in. broad.

Huilla.—Rather rare in woody thickets at Caminho de Quipungo: April 1860. No. **2628**. Common in wooded places near streams near Catumba in the Lopollo district; April 1860. No. **7497**.

6. **S. rhachitricha.**

*Panicum rhachitrichum* Hochst. in Flora xxvii. p. 254 (1844); Steud., *l.c.*, p. 63; Durand & Schinz, *l.c.*, p. 761.

Golungo Alto.—Rather damp shady places at base of the Alto Queta mountains, but rare; Aug. 1855. No. **7172**. In rather damp places, Alto Queta; beginning of Aug. 1855. No. **7191**. Somewhat rare in wooded dampish places, Mata virgem de Quibanga (Mussengue); Mar. 1856. No. **7207**.

Pungo Andongo.—Damp meadows between Bumba and N-bilia at the right bank of the river Cuanza; March 1857. No. **7435**.

26. **CENCHRUS** L.; Benth. & Hook. f. Gen. Pl. iii. p. 1105.

1. **C. catharticus** Delil. Cat. Hort. Monspel. 1838 in Linnæa xiii. Litt.-ber. p. 103 (1839); Steud. Syn. Pl. Gram., p. 111 (1854); Durand & Schinz, Consp. Fl. Afr. v., p. 775.

Ambriz.—Nov. 1853. No. **2900**.

Loanda.—An annual sparsely cæspitose grass, with oblique or erect culms. Common in dry sandy plains near Penedo; Jan. 1859. No. **2915**. An annual sparsely cæspitose grass, with flowering culms erect or ascending, rather rigid. Grows among poor herbage on the way from Alto das Cruzes to Penedo and Boa Vista; Jan. 1854. No. **7306**. No. **7347** (no information).

Pungo Andongo.—In overgrown grassy places near Sansamanda: Feb. 1857. No. **2791**.

27. **PENNISETUM** L. Rich.; Benth. & Hook. f. Gen. Pl. iii. p. 1105.

Sect. 1.—Gymnothrix.

1. **P. alopecuroides** Spreng. Syst. i. p. 303 (1825) pro parte; Steud. in Flora xii. 1. p. 472 (1829), Syn. Pl. Gram. p. 103 (1854).

*P. adoense* Steud., *l.c.*, p. 104; Durand & Schinz, Consp. Fl. Afr. v. p. 777.

Huilla.—In rich pastures with short overgrowth between Lopollo and Monino; Jan. 1860. No. **2685**.

2. **P. parviflorum** Trin. Gram. Pan. p. 64 (1826), Gram. Icon. et Descr. iii. t. 288 (1836); Steud., *l.c.*, p. 103; Durand & Schinz, *l.c.*, p. 782.

Golungo Alto?—Nos. **2971**, **2976**, **7267***c* (no information).

3. **P. angolense** Rendle sp. nov.

Very tall, with unbranched erect culms and long tapering more or less erect involute leaves; spikes long, cylindrical, whitish; spikelets curved, lanceolate, membranous, densely packed, the spreading setæ of the involucre becoming reversed; glume I. minute, orbicular-ovate; gl. II. half the length of the spikelet, ovate, 3-nerved, the prominent midrib produced into a short awn; gl. III. ovate-lanceolate, 5-nerved, subtending a subequal flat pale with a ♂ flower; fertile gl. slightly longer, ovate, acute, 5-nerved, with membranous incurved edges and a similar slightly narrower pale.

A tall reedy grass, the shoots reaching 5 to 12 ft. high. Internodes smooth, terete; nodes glabrous; sheaths loose, membranous, striate, exceeding the long internodes, hairy at the mouth; ligule a line of stiff dense whitish hairs about 1 line long; lamina 10 to 22 in., linear-tapering, with the margins rolled inwards, and a long aristiform apex; spikes $7\frac{1}{2}$ to $11\frac{1}{2}$ in. on the specimens; according to Welwitsch's note often exceeding a foot; setæ of involucre rather stiff, $\frac{1}{6}$ to $\frac{1}{2}$ in. long, with ascending barbs. Spikelets 2 or scarcely 2 lines long; glume I. enerved, hyaline, $\frac{1}{4}$ to scarcely $\frac{1}{3}$ line; gl. II. thinly membranous, with a prominent midrib and 2 inconspicuous lateral veins running $\frac{1}{3}$ to $\frac{1}{2}$ the length from the base, $\frac{2}{3}$ to 1 line including the awn; gl. III. $1\frac{2}{3}$ line, sometimes with a sixth nerve passing $\frac{2}{3}$ the way up from the base. Fertile gl. membrano-coriaceous, $1\frac{3}{4}$ line, including a ♀ flower.

Near *P. hordeiforme* Spreng., which it closely resembles in habit, but is distinguished by the smaller more membranous spikelets with the awned not rounded second barren glume. The involucral hairs are less stiff, and their ultimate spreading or reversed position gives the spike a different appearance.

Pungo Andongo.—A grass 5 to 8 or 10 ft. high, laxly cæspitose, with erect culms; spikes whitish, growing in large patches in marshy clayey places between Condo and Bumba; March 1857. No. **2723**. A very tall grass, 8 to 12 ft., but always with unbranched straight culms; spikes always over a foot, white, erect. Near Sobato Bumba, thickly massed over wide areas in marshy places; 15 March 1857. No. **7426**.

Var. **laxespicata** Rendle var. nov.

Differs from the type in its less crowded spike and smaller spikelets scarcely exceeding $1\frac{1}{2}$ lines long.

Huilla.—Very plentiful in wooded places round deep marshes, near Ohay; middle of May 1860. No. **7507**.

Sect. 2.—Eupennisetum.

4. **P. purpureum** Schum. in Dansk. Vidensk. Selsk. iii. p. 64 (1828).
*P. Benthami* Steud., *l.c.*, p. 105; Durand & Schinz, *l.c.*, p. 777.
*P. macrostachyum* Benth. in Hook. Niger Fl. p. 563 (1849).

Loanda.—A gigantic and very beautiful grass, growing about deep marshes, rising to 4·5 to 5 metres high. Marshes near Represa do Sr. Perreira Van Hunen; thickly cæspitose; July 1854. No. **7325**.

Cultivated at Welwitsch's country house ; in fl. Aug. 1854. **No. 7298*b***. Native name Massango.

Icolo e Bengo.—Common on the king's highway from Prata to Quicanga, etc., often covering very wide areas in thick clumps, sometimes 2 to 3, sometimes 8 to 9 ft. high ; Sept. 1854. **No. 7267**.

Golungo Alto.—Native name Marianga. A perennial grass, with stems becoming woody below, 8, 12 to 15 and even 20 ft. high ; leaves glaucous ; flowers pale yellowish or yellowish to reddish. Too plentiful everywhere in the primæval wooded region. Sange ; in fl. July 1857. No. **2767**. No. **2884** (no notes). A gigantic grass, suffruticose, branches erect often viviparous from the culm, culm 8 to 18 ft., spike narrow, a foot long. Very plentiful and densely cæspitose in secondary thickets called *Capinaes* ; fl. and fr. July 1856. **No. 7215**. Rhachis continuous, scarcely flexuose, thickly covered with spreading hairs. Residency garden ; 14 Sept. 1856. **No. 7384**. Native name Massango. Rhachis densely flexuose towards the top. Awns very long, blood-purple. Banks of river Cuango ; 13 and 14 Sept. 1856. No. **7298**. (Massango).

*Pennisetum Benthami* Steud. (*P. macrostachyum* Benth.) cannot be separated from *P. purpureum* Schum. In several of Welwitsch's specimens the setæ are tinged with red or purple, forming an approach to the deep purple setæ and glumes of Schumacher's description, and occurring also in a plant from Guinea received from Thonning on which Flügge based his ms. species, and which came to the British Museum in Herb. Nolte.

5. **P. setosum** L. Rich. in Pers. Synops. i. p. 72 (1805) ; Durand & Schinz, *l.c.*, p. 784.

*P. polystachyum* Schult. Mant. ii. p. 146 (1824) ; Benth., *l.c.* *P. purpurascens* H. B. & K. Nov. Gen. and Sp. i. p. 113 (1815).

Golungo Alto.—A small erect plant, about 10 in. high, with a delicate thinly flowered spike. In grassy sunny places between Sange and Ponte de Luiz Simões ; Feb. 1855. **No. 7181**. Common in reedy thickets on the left of the river Delamboa. Spikes when in flower a splendid purple, becoming finally more or less dull purplish ; May 1855. **No. 7194**. A grass 5 to 6 ft. high ; culm erect, branching above, spikes elongated, golden-yellow, very acuminate, graceful and nodding. Rather rare, occurring with *Andropogon* in somewhat dry places near Menha Lula, Sobato de Mossangue ; May 1885. **No. 7274**. Nos. **2967**, **7232**, **7262**, **7267*b***, **7267*d*** (no information).

6. **P. cenchroides** L. Rich., *l.c.*

*P. ciliare* Link Hort. Berol. i. p. 213 (1827) ; Durand & Schinz, *l.c.*, p. 778. *Cenchrus ciliaris* L. Mant. p. 302 (1771).

Cape Verde Islands ?—**No. 2922** (no information).

Loanda.—A grass 2 to 3 ft. high, laxly cæspitose ; culms sometimes straight, sometimes arcuate-ascending ; spikes purplish. Among herbage near Quicuxe ; Oct. 1858. **No. 7317**. A panicoid grass, with cæspitose branched ascending culms, and purplish spikes. Common in thicket-grown pastures between Penedo and Conceiçao ; Jan. 1859. **No. 2920**. No. **7481** (no information).

Mossamedes.—A cæspitose grass, with erect or ascending culms a foot high, and purplish-green scabrid stiffish spikes an inch long. Sandy places on the banks of the river Bero near the gardens ; 5 Aug. 1859. No. **2621**.

Sect. 3.—Penicillaria.

7. **P. typhoideum** L. Rich., *l.c.*

*P. spicatum* R. & S. Syst. ii. p. 499 (1817). *Holcus spicatus* L. Syst. ed. x. p. 1305 (1759). *Panicum spicatum* Roxb. Fl. Ind. i. p. 283 (1832). *Penicillaria spicata* Willd. Enum. Hort. Berol. p. 1037 (1809).

* *Partial inflorescence stalked.*
† *No awn-like development of the involucre.*

Var. **typicum** K. Schum. in Engl. Pflanz.-Welt. Ost-Afrik. B. p. 55 (1895).

Leaf-blades and sheaths glabrous, margins of upper sheaths ciliate, lower nodes glabrous, upper with a dense ring of short white hairs; a similar ring occurs below the union of leaf-blade and sheath; scape densely pubescent below the "spike." Spike very dense, cylindrical, narrowing to the apex, which in the Loanda specimens is comose, greenish or purplish, when ripe 7 in. long by $\frac{3}{4}$ in. thick. Stalk of partial inflorescence about 2 lines long, densely white-hairy; involucre enclosing 2 sessile spikelets and scarcely equal to them in length, one seta sometimes slightly exceeding the rest, the shorter ones not plumose. The two outer glumes small, hyaline, enerved, with truncate and sometimes ciliolate apex; glume I. about $\frac{1}{2}$ line long, gl. II. slightly longer, gl. III. $1\frac{1}{2}$ line, broadly elliptical, 3-nerved, apex truncate, sometimes ciliolate, faintly mucronate, subtending a subequal pale with shortly hairy nerves and a ♂ flower; fertile gl. obovately oblong to broadly elliptical, convex, 5- to 7-nerved, with truncate broken and ciliolate or mucronate apex. Grain obovate, dull grey-brown, a little over 1 line ($1\frac{1}{6}$) long.

Loanda.—Formerly cultivated under the name "Milho de Bisao" in Arimo de Quicuje (arimo = cultivated field). Feb. 1854. No. **3005**.

Huilla.—Massango lizo Welw. Synops. Expl. p. 35 (1862). Plentifully cultivated by the natives, and called Massango by those dwelling between Monino and Lake Ivantâla. In fl. Feb., in fr. May 1860. No. **2680**. End of May 1860. Coll. Carp. 1098.

†† *One involucral seta produced into a long awn.*

Var. **echinurum** K. Schum., *l.c.*

Leaves, etc., as in var. *tipicum*. "Spikes" dense, cylindrical or broadening from the base to $\frac{1}{3}$ from the apex, nearly 9 in. long by 10 to 12 lines without the awn. Partial inflorescence with a white-hairy stalk of 1 to 3 lines; involucral setæ plumose, purple, exceeding the 2 spikelets, about 4 lines long, one elongated into an awn 6 to 7 lines; setæ ascending, spikelets stalked, stalk $\frac{2}{3}$ line long, 2-flowered; two outer glumes small, hyaline, enerved; gl. III. including a ♂, gl. IV. a ♀ flower, both ovate and mucronulate.

Huilla.—Massango barbado Welw., *l.c.* Plentifully cultivated throughout the district, especially towards the north and east of the colony of Lopollo; Feb. and May 1860. No. **2679**.

** *Partial inflorescence sessile.*

Var. **Plukenetii.**

*Penicillaria Plukenetii* A. Br. in Ind. Sem. Hort. Berol. 1855, App. p. 24.

Leaf-blades and sheaths hirsute; a ring of white hairs at the nodes and below the leaf-blade. Spikes cylindrical, narrowing to the generally comose apex, from a little over 4 to 10 in. long by 7 to 9 lines thick, not including the awn, golden-yellow or purple. Involucre exceeding the single spikelet or subsessile pair, setæ plumose, about $\frac{1}{2}$ in., the longest about 1 in., ascending, sometimes becoming horizontal or descending. Spikelets 2 lines long, lanceolate; gl. I. small, hyaline, $\frac{1}{4}$ to $\frac{2}{3}$ line, ovate or oblong from a truncate base, enerved; gl. II. ovate, obovate and retuse, or truncate-elliptical, enerved, 1-nerved, or sometimes with a small lateral nerve on each side, $\frac{1}{2}$ to nearly 1 line long; gl. III. ovate, mucronulate, 3- to 5-nerved, $1\frac{1}{2}$ line long, subtending a subequal pale with pilose nerves, and a ♂ flower, or shorter (1 line) oblong and empty; gl. IV. nearly 2 lines long, ovate with a mucronate, rarely scarcely mucronulate apex, 5-nerved, subtending a subequal pale and a ♀ flower.

Loanda.—Massango, a fine-looking grass, annual, 4 to 6 ft., subcæspitose, erect, spikes yellowish. Sporadic in thickets between Penedo and Conceiçao; end of May 1858. No. **7278**. 5 to 8 ft. high, culms crowded, branched towards the top, hollow, spikes $\frac{1}{2}$ to 1 ft., comose at the top, coma of an elegant rose colour, finally recurved in mature spikes. Rather rare in fields once cultivated, and even springing up on all sides in abandoned gardens in the town of Loanda: cultivated in Sr. A. Lopes de Silva's garden; 7 July 1854. No. **7321**. Coll. Carp. 1091.

Golungo Alto.—A very fine grass 3 to 5 ft. high, spikes 7 to 10 in. long, of a deep blood-red colour ("intense sanguineis," the spikes in the dried specimens are purple). Grows along with *Pennisetum giganteum* (Marianga), but is much rarer, in grassy places near Sange; end of April and May (more advanced) 1855. No. **7275**. An annual grass, 4 to 6 ft. high, culm at first straight, then ascending, rooting at the nodes, spikes when flowering a very fine purple, then dark purple, more rarely golden. On grassy hills between Sange and Menha-Lula; May 1855. No. **7276**. A beautiful grass, pyramidally branched, 7 to 10 ft. high, cultivated by the negroes and more rarely by the settlers, spontaneous everywhere, and known as Massango; the seeds are much liked by sparrows. Spontaneous on the left of the Quiapose stream near Sanches; Feb. 1855. No. **7276***b*. Cultivated in the garden of the governor of the district; called by the natives Massango; liked by sparrows. May 1855. No. **7276***c*.

Sect. 4.—Beckeropsis.

8. **P. dioicum** A. Rich. Tent. Fl. Abyss. ii. p. 380 (1851); Durand & Schinz, *l.c.*, p. 778.

*P. longisetum* K. Schum., *l.c.*, C. p. 105 (1896); *P. unisetum* Benth. in Journ. Linn. Soc. xix. p. 49 (1881); Durand & Schinz, *l.c.*, p. 786. *Beckera dioica* Nees in Linnæa xvi. p. 219 (1842); *B. uniseta* Hochst. in Flora xxvii. p. 512 (1844); *B. nubica* Hochst.,

*l.c.*; *B. petiolaris* Hochst., *l.c.* *Beckeropsis nubica* Fig. & De Notar., in Mem. Accad. Sci. Torin. Ser. 2. xiv. p. 366 (1854); *B. petiolaris* Fig. & De Notar., *l.c.*, p. 368. *Gymnothrix uniseta* Nees Fl. Afr. Austr. i. p. 66 (1841); *G. petiolaris* Hochst., *l.c.*, p. 250; *G. nubica* Hochst., *l.c.*, p. 251. *Setaria longiseta* Beauv. Fl. Ow. p. 81, t. 110 (1818-20).

Golungo Alto.—A grass 5 to 8 ft., remarkable among all the species of this genus hitherto observed for its pale greenish colour. In the so-called Capineta, but not common, near Sange; beginning of June 1855. No. **2957**. Called Musoque by the natives and used everywhere for roofing their houses. A tall grass 6 to 8 ft. high, cæspitose, culms fastigiately branching towards the top. Is one of the gigantic grasses which form the so-called Capim of Golungo Alto. Grows in damp places along with *Typha*, etc., near Sange; in fl. Nov. 1854. No. **7178**. A grass with the habit of *Andropogon*, 4 to 5 ft.; culm branching, nodose, obliquely bent at the nodes; spikes nodding. At margins of fields near Camilungo; June 1856. No. **7206**. No. **7227** (no information).

28. **ANTHEPHORA** Schreb.; Benth. & Hook. f. Gen. Pl. iii. p. 1122.

1. **A. elegans** Schreb. Beschr. Graes. ii. p. 105 (1774).

Var. **cristata** Doell in Mart. Fl. Bras. ii. pt. 2. p. 314 (1877).

Loanda.—An annual grass, laxly cæspitose, culms branched ascending, leaves flat, spikes terminal, solitary, 2 in. long, very rigid, rhachis flexuose. Very common in poor sandy pastures and also among plantations of manioc, etc.: almost everywhere along the whole Angola coast. Alto das Cruzes; Dec. 1858. No. **7310**. In grassy places near Forte de Penedo; Mar. 1854. No. **7346**. 1853-4. Nos. **7371**, **7371***b*, **7371***c*, **7371***d*. Nos. **2915***b*, **7480** (no information). Penedo; April to May 1854. Coll. Carp. 1112.

Pungo Andongo.—In sandy thickets between Luxillo and Cazella; middle of Dec. 1856. No. **2754**.

Var. **acuminata** Rendle var. nov.

Partial inflorescences large (3 to $3\frac{1}{2}$ lines long), involucral limbs 5 to 6, free almost to the base, lanceolate-acuminate, surface minutely upwardly scaberulous; spikelets narrow-lanceolate, $2\frac{1}{2}$ lines long.

Pungo Andongo.—Candumba; Mar. 1857. No. **2708**.

Huilla.—A perennial grass, 3 ft. high, laxly cæspitose, culms erect. Anthers 3, golden-ochre, stigmas bifid, shortly plumose, white. In stony thickets between Lopollo and Monino; not liked by cattle; Feb. 1860. No. **2632**.

2. **A. undulatifolia** Hack. in Bull. Herb. Boiss. iv. App. iii. p. 12 (1896).

Mossamedes.—On low sandy hills between Mossamedes and Giraûl; 19 July 1859. No. **2615**.

29. **LEUCOPHRYS** (λευκόφρυς, "with heavy eyebrows") Rendle gen. nov.

*Panicum* L., Benth. & Hook. f. Gen. Pl. iii. p. 1100, pro parte.

Spikelets membranous, laterally subcompressed, ♀. Outermost

glume large, lanceolate, papery, subglabrous, longer than, rarely subequal to, the second; gl. II. separated from gl. I. by a short thick joint, lanceolate-acuminate, membranous, bearing a line of stiff erect whitish hairs below the middle, becoming papery above the line of hairs; gl. III. similar to but a little shorter and broader than the second, sheltering a subequal flattened pale with a ♂ flower (3-androus); gl. IV. about half as long as the barren glumes, oval, convex, coriaceous, polished, with a subequal pale and a ♀ flower. Panicle narrow, spikelets densely arranged on the short sometimes subdistant lateral branches of a stiff rhachis; pedicel jointed a short distance below the lowest glume. Apparently a psammophilous plant, with rigid glaucous spreading nodose branches and short subfleshy involute pointed leaves.

Distinguished from *Panicum* by its large papery outer glume, often exceeding the second. Resembles *Tricholæna* in the presence of the callus below the second glume and the transverse demarcation of the inner barren glumes by a line of hairs, but is distinguished by the size of the outer glume which is the most important in the spikelet, and not as in *Tricholæna*, a mere rudiment. The difference between the genera resembles that between *Digitaria* and *Panicum*, but is in a much greater degree.

Hab.—Subtropical south-west Africa (Namaqualand and Mossamedes). Species one.

1. **L. mesocoma.**

*Panicum mesocomum* Nees Fl. Austr. Afr. p. 34 (1841); Steud. Syn. Pl. Gram. p. 88 (1854); Durand & Schinz, Consp. Fl. Afr. v. p. 754.

Mossamedes.—A perennial grass, stem branched from the base, branches widely spreading at an obtuse angle, very rigid and brittle, glaucous: leaves resembling those of a *Dianthus*, subfleshy glaucous, falcately recurved. In gravelly soil by the banks of the river Bero; end of June 1859. No. **2295**.

30. **TRICHOLÆNA** Schrad. ex Roem. & Schult. Mant. ii. p. 163 (1824).

*Panicum* L., Benth. & Hook. f. Gen. Pl. iii. p. 1103, pro parte.

1. **T. rosea** Nees Fl. Afr. Austr. p. 17 (1841); Durand & Schinz, Consp. Fl. Afr. v. p. 770.

*Panicum roseum* Steud. Syn. Pl. Gram. i. p. 92 (1854).

Huilla.—A cæspitose grass 2 ft. high, with erect stems, very narrowly linear leaves, and shining-silvery spikelets. In damp pastures close to streams near Humpata; end of Nov. 1859. No. **7517**. In poorer meadows near Lopollo; Jan. 1860. No. **2649**. In rather dry thickets between Catumba and Nene; April 1860. No. **2663**. In wooded places near Lake Ivantâla; Feb. 1860. No. **2666**.

2. **T. grandiflora** Hochst. in Flora xxiv. Intell. i. p. 19 (1841) (nomen); A. Rich. Tent. Fl. Abyss. ii. p. 445 (1851); Durand & Schinz, *l.c.*, p. 769.

*T. fragilis* A. Br. in Flora xxiv. p. 275; Durand & Schinz,

*l.c.* ; *T. Dregeana* Durand & Schinz, *l.c.* ; *Panicum Braunii* Steud., *l.c.*, p. 93.

*Rhynchelythrum Dregeanum* Nees, *l.c.*, p. 64.

Loanda.—A grass apparently lasting several years, laxly cæspitose, with stems ascending or suberect, branched, 2 to 3 ft. long. Spikelets clothed with long closely clinging hairs of a very beautiful rose-violet ; one of the most elegant of grasses. Rather plentiful in sandy, especially rather damp plains, but also in dry places, where the stems are scarcely a foot long. Represa de Luiz Gomes in the Loanda district ; Jan. 1859. No. **2908**. No. **7330** (no information). Cacuaco ; May 1854. No. **7472**. A cæspitose grass, with shining violet flowers, and the habit of *Aira*. Cacuaco on low hills covered with herbage ; July 1854. Coll. Carp. 114.

Zenza do Golungo.—In dry rocky places near the river Calucala ; Sept. 1854. No. **7211**.

Golungo Alto.—A grass 2 to 4 ft. high, remarkable from its shining-silvery spikelets. In damp meadows on the edges of woods in Sobato da Bumba ; May 1855. No. **7243**. Flowers a beautiful silvery-violet. In wooded meadows. Sobato da Bumba ; Dec. 1855. No. **7241**. 6 to 8 ft. high, culms prostrate-ascending, rooting at the nodes. By the cataracts of the river Cuango near Cacuso ; beginning of August 1855. No. **3002**. No. **7242** (no information).

Pungo Andongo.—A grass 3 to 3½ ft., apparently annual and also perennial, panicle shiny-violet, conspicuous among all the grasses of the district, and a striking ornament in rather damp meadows and pastures, where it grows in great quantity. Plentiful in rather damp thicket-grown pastures close by the banks of the river Cuanza near Candumba, etc. ; Jan. 1857. No. **2774**. Lombe in rather damp meadows ; very beautiful ; March 1857. No. **2721**. Spikelets becoming violet. In rocky thickets in the præsidium ; May 1857. No. **2828**.

Mossamedes.—In sandy places covered with short bushes at the banks of the river Bero near Cavalheiros ; July 1859. No. **2288**.

Huilla.—In wooded meadows of Morro de Monino, now almost entirely fed down ; May 1860. No. **2664**. In abandoned fields and neighbouring thickets, and also among maize plantations throughout the whole country of Lopollo. Affords excellent fodder for cattle. April 1860. No. **2665**. A grass 3 to 4 ft. high, laxly cæspitose, narrow-leaved, flowers panicled, shining purple at first, then cinnamon. Plentiful in rather damp meadows near Lopollo ; in fr. April 1860. Coll. Carp. 1111.

The spikelets vary much in size in different specimens, from 1½ to nearly 3½ lines long. The largest occur in the Mossamedes plant. With so complete a gradation in size the establishment of major or minor varieties is meaningless.

Var. **collina** Rendle var. nov.

Smaller than the type with slender rigid shoots (14 to 18 in. high) spreading from the base and short rigid generally convolute leaves. Lower internodes ½ line in diameter ; leaves 1½ to 5 in. generally 2 to 4 in. long, and when not convolute about 1½ line broad. Spikelets 1¾ to 2 lines long, hairs reddish or almost white.

Ambriz.—Nov. 1853. No. **2894**.

Loanda.—Low hills near Quifandongo ; Dec. 1853. No. **7309**. Dry places near Maianga do Povo ; July 1858. No. **7309***b*. Hills near Cacuaco ; Dec. 1853. No. **7342**.

Var. **glabrescens** Rendle var. nov.

Outer surface of the barren glumes almost glabrous, except on the keel of the second, which bears a line of hairs in the lower half.

Huilla.—Spikelets sometimes violet sometimes yellowish. In rocky places near the cataract on the river at Fazenda de Ferrão da Sola, in the district of Lopollo ; Feb. 1860. No. **7653**.

Mossamedes.—In sandy thickets at Quipola, but not plentiful ; Aug. 1859. No. **2610**.

3. **T. bellespicata** Rendle sp. nov.

Cæspitose, shoots ascending, branched, pilose-hirsutulose, becoming glabrous above ; nodes densely hairy ; leaves linear, tapering towards both ends, acute ; panicle dense, secund, spikelets large, bearing long stiffish red shining hairs ; glume I. minute ; gl. II. separated by a short internode from the first, large, coriaceous, folded along the stout hairy midrib, which is prolonged into an awn equal to the length of the glume ; gl. III. similar but narrower than the second, and with a longer awn, including a shorter narrow membranous pale with a ♂ flower ; fertile gl. small, membranaceo-coriaceous convex, subtending a similar but shorter pale and a ♀ flower.

Perennial (?) from a slender rhizome ; shoots 16 to 20 in. long. Internodes slender, $\frac{1}{2}$ line in diameter at the base of the shoot, the lower ones short, hairy, the upper elongated and glabrous except below the nodes. Sheaths reddish, membranous, striate, lower ones exceeding the internodes and bearing numerous whitish hairs often from a tubercled base ; upper becoming looser and shorter than the internodes, subglabrous or glabrous ; ligule represented by a line of short dense hairs ; blade flattened, subrigid, generally $3\frac{1}{2}$ to $5\frac{1}{2}$ in. long by $1\frac{1}{4}$ to $1\frac{3}{4}$ lines broad, tuberculately pilose especially on the under face. Panicle $3\frac{1}{2}$ to 4 in. long, branches ascending, secund, lowest about 1 in. long, spikelets shortly stalked on the branches, or small lateral branchlets. Pedicel bearing a small tuft of spreading hairs on the swollen end. Spikelets about $2\frac{1}{2}$ lines long. Glume I. $\frac{1}{2}$ line long, coriaceous, scaphoid, the end truncate or rounded, enerved, bearing a short tuft of hairs at its insertion ; gl. II. about $2\frac{1}{4}$ lines long, with a pair of well-marked lateral nerves, each half narrowly suboblong, tapering above to a rounded tip which projects slightly beyond the insertion of the awn, margin ciliolate, back and sides bearing numerous stiffish rosy hairs, often from a tubercled base, about equal to the length of the glume ; gl. III. with an awn twice its length and tubercled hairs chiefly near the margin and especially in the upper half, pale $1\frac{5}{6}$ line long, glabrous, sharply folded between the well-marked nerves ; sometimes two of the three stamens are minute and apparently barren. Fertile gl. $1\frac{1}{2}$ line long, glabrous, inconspicuously 5-nerved, with narrow oval-oblong sides tapering towards the bluntish tip ; pale $1\frac{1}{4}$ line long.

Near the Abyssinian *T. longiseta* Hochst., from which it is distinguished by habit, leaves with narrow base, and larger spikelets with stronger proportionately narrower second and third barren

glumes and a fertile glume markedly longer than, not subequal to its pale.

Pungo Andongo.—A fine grass, cæspitose, conspicuous with its rose-coloured shining spikelets. Somewhat plentiful in mountain meadows between Pedras de Guinga and Condo; March 1857. No. **7425**.

4. **T. rupicola** Rendle sp. nov.

Perennial, widely cæspitose, shoots decumbent-ascending, simple or sparsely branched below, more or less densely branched towards the apex; leaves short, rigid, linear-tapering, acute, margins and sheaths scabridly hairy, ligule represented by a row of short hairs; flowering-shoots terminal, elongated far above the leafy tufts; panicle small, lax, slender, spikelets long-stalked or terminal on the filiform, often purplish, primary branches, erect-campanulate, pilose, hairs appressed, silky, shining-white tipped with purple; glume I. at the base of gl. III. minute, hairy; gl. II. stout, subcoriaceous, convex, elliptical when flattened with a subretuse apex, 5-nerved, the inner pair of nerves converging to the apex of the midrib which passes into a fine upwardly barbed awn generally exceeding the glume in length; gl. III. subequal, oblong, 5-nerved, apex flattened, cuspidate, subtending an equal narrow much compressed pale with a ♂ flower; fertile gl. glabrous, about $\frac{3}{4}$ length of the barren, thinly coriaceous, transparent, ovate, subacute, 5-nerved, with a similar but narrower subequal pale and ♀ flower.

Plants a foot or more high, shoots densely tufted, internodes short, enveloped in the leaf-sheaths, leaf-blades $\frac{3}{4}$ to $1\frac{3}{4}$ in. long by 1 line or less in width, the younger ascending, the older spreading and becoming purple. Inflorescence carried above the leaves on a long slender wiry internode, which may reach 9 in. long, and is sheathed at the base by a long slender cylindrical glabrous reddish sheath; fully developed panicle about 2 in. long, with 12 to 24 spikelets. Spikelets about 2 lines long; glume I. including its spreading hairy coma only $\frac{1}{2}$ line long; gl. II. $1\frac{2}{3}$ to $2\frac{1}{4}$ lines long, the upper third more membranous, slightly compressed and glabrous, the outer pair of nerves falling short of the apex, awn 1 to 3 lines; gl. III. $1\frac{2}{3}$ to 2 lines long, resembling gl. II. in texture and hairiness, pale with strongly marked keeled nerves which are ciliolate above; fertile gl. about $1\frac{1}{2}$ line long, lodicules truncately obcuneate, yellow, anthers yellowish-brown, a little over 1 line long.

A very distinct species, perhaps nearest *T. Wightii* Nees, from which however it is easily distinguished by its very characteristic habit, minute outer glume, and blunt barren glumes.

Pungo Andongo.—Perennial, widely cæspitose, culms simple at the base, branched towards the apex, slender, leaves spreading, hairy, the older becoming purple. On the higher rocks of the præsidium; April and May 1857. No. **7393**. Pedra Cabondo almost on the highest rocks; May 1857. No. **2718**.

5. **T. tanatricha** Rendle sp. nov.

A cæspitose annual, culms slender, erect from a slightly

decumbent base, nodes shortly hairy, lower internodes short, covered by the compressed leaf-sheaths, subterete with a deep longitudinal groove; ligule represented by a row of white hairs less than 1 line long; blade linear-tapering, acute, like the sheaths sparsely scabridulously hairy when young; panicle elegant, secund, carried far above the foliage on the elongated slender ultimate internode; spikelets elongated, sessile or subsessile on the short flexuose branches of the stoutish, scabridulous, deeply striate, angular rhachis, with an involucre of stiffish white-red transparent hairs about half its length; glume I. minute, hairy; gl. II. subchartaceous, convex, oblong when flattened and tapering towards the bifid apex, scabridulous, especially on the 5 conspicuous straight nerves, awn many times exceeding the spikelet; gl. III. resembling gl. II. but slightly shorter and narrower with a fine awn one to several times its length or awnless and mucronate, slightly exceeding the pale with its ♂ flower; fertile gl. subcoriaceous, ovate-lanceolate, with minutely emarginate apex, 5-nerved, pale subequal similar but narrower.

Plants reaching 2 ft. in height, lower internodes $\frac{1}{2}$ to 1 in. long, the slenderer penultimate one exceeding its sheath, 3 to 4 in. long, the ultimate 10 to 12 in.; leaves 1 to 7 in. long, by $1\frac{1}{4}$ to $2\frac{1}{2}$ lines broad, more or less ascending. Panicle 5 to 6 in. long, lateral branches about 1 in. below, becoming shorter upwards, with 1 to $\frac{1}{2}$ in. interval between; spikelets $2\frac{1}{2}$ to 3 lines long; glume I. including the hairs less than $\frac{1}{2}$ line; gl. II. the length of the spikelet, minutely ciliolate on the edges and sometimes sparsely shortly pilose on the back, awn 2 to 4 in. long, purplish, minutely upwardly barbed; gls. II. and III. pale stramineous or pale greenish, sometimes tipped with purple; fertile glume about $\frac{2}{3}$ length of gl. II., greenish with margins minutely ciliolate above; lodicules truncately obcuneate, anthers brownish, 1 line long.

A very interesting species approaching the genus *Melinis* in the conspicuous straight nerves of its glabrescent barren glumes. It is nearest to *T. uniglumis* Durand & Schinz, but distinguished by its narrower, less robust, long-awned spikelets, minute outer glume, etc.

Pungo Andongo.—An annual cæspitose grass, 2 ft. high, panicles secund, very long-awned, purplish. Sandy wooded meadows between Caghuy and Sansamanda; April 1857. No. **7413.** Damp meadow near Sansamanda; Feb. 1857. No. **2781.** No. **2852** (no information).

**6. T. minutiflora** Rendle sp. nov.

Tall, cæspitose, culms decumbent-ascending, branched, internodes strong, terete, pubescent, except the upper enveloped for the whole or greater part of their length by the sheaths; nodes densely pubescent; ligule a line of short hairs; leaves spreading, flat, rigidulous, narrowly linear-lanceolate, acute, reddish, margin scabridulous-pilose, faces sparsely pilose; panicle much branched, dense, narrow-lanceolate; spikelets shortly stalked, scarcely exceeding 1 line long, truncate; gl. I. about $\frac{1}{4}$ the length of the spikelet, hairy at the base only; gl. II. thinly coriaceous below,

becoming membranous in the upper third, obovate when flattened, with 2 parallel nerves on each side the midrib anastomosing below the apex, apex bilobed, margin ciliate in the upper two-thirds, midrib bearing a median dorsal tuft of hairs, awn fine, about $2\frac{1}{2}$ times the length of the glume; gl. III. similar but narrower, slightly shorter, and membranous, with a marginal tuft of hairs on each side; pale narrow, hyaline, slightly shorter; fertile gl. $\frac{3}{5}$ the length of the spikelet, glabrous, thinly coriaceous, transparent, elliptical with shortly bilobed apex, inconspicuously 3-nerved, enclosing a slightly shorter pale.

Plants 3 ft. high; internode below the flowering one 6 to 7 lines long, the lower $1\frac{1}{2}$ to 2 in. long, 1 line or less in width, clothed with the numerous reddish sheaths; ligule about $\frac{1}{4}$ line long; leaves from 1 to $3\frac{1}{4}$ in. long by $1\frac{1}{2}$ to $3\frac{1}{2}$ lines broad. Panicle about 4 in. long, generally less than 1 in. in width, previous internode 9 to 10 in., branches solitary, ascending to suberect, bearing numerous short slender flexuose branches. Spikelets truncate-elliptical, $1\frac{1}{4}$ line long; gl. I. hyaline, oblong, truncate, $\frac{1}{3}$ line long; callus below gl. II. bearing a lateral tuft of hairs; gl. II. a little over 1 line long, awn $2\frac{3}{4}$ lines; gl. III. 1 line long; fertile gl. $\frac{2}{4}$ line long.

Recalling *T. scabrida* K. Schum. in habit, but a very distinct species characterised by its small laterally much-compressed spikelets, and tufted-hairy subcoriaceous awned glumes.

Pungo Andongo.—A cæspitose grass, 3 ft. high, with habit of *Holcus*. Plentiful, but in one place only, in the dry rocky woods near Sansamanda on the river Cuanza, and on the rocks near Sepulchra Mopopo; 30 Apr. 1857. No. **2731**.

The following may belong to the genus, but in absence of flowers determination is impossible:—

Pungo Andongo.—Dec. 1856. No. **2762**.

31. **MELINIS** Beauv.; Benth. & Hook. f. Gen. Pl. iii. p. 1119.

1. **M. minutiflora** Beauv. Agrost. p. 54 (1812); Durand & Schinz, Consp. Fl. Afr. v. p. 735.

*Panicum Melinis* Trin. in Mém. Acad. Sci. Petersb. ser. 16. iii. pt. 2. p. 291 (1834); Steud. Syn. Pl. Gram. p. 84 (1854).

Golungo Alto.—Panicles broadly pyramidal and a deep purple wine-colour, an ornament of the pastures but from the viscosity of stem and leaves a great nuisance and disliked by cattle. Grows in dense masses in damp meadows, and also, but more rarely, in dry thickets near Sange and in the whole province of Golungo. Called *Capim melado* by the Portuguese colonists from the stickiness of stem and leaves; Dec. 1854. No. **2992**. Common in damp wooded places at Cungulungulo; Apr. 1856. No. **7198**.

Pungo Andongo.—Thickets between Catete and Luxillo; May 1857. No. **7392**. A cæspitose grass, 3 to 4 ft. high, with ascending culms. In lofty rocky places at Pedra Cabondo; Apr. 1857. No. **2729**.

The spikelets vary in length from $\frac{3}{4}$ to nearly $1\frac{1}{4}$ line, in the width of the glumes, especially of gl. III., the greater or less

prominence of the veins, the size of the minute lowest barren glume, and the presence or length of the awn on the third glume. The awn may be present or absent in the same panicle. Gls. II. and III. may be glabrous or slightly hairy.

Var. **inermis** Doell in Mart. Flor. Bras. ii. pt. 2. p. 242 (1877).

Golungo Alto.—Perhaps a variety of the grass called *Capim melado*. Rather rare in sunny grassy places on the Cuango near Sange; Feb. 1855. No. **2991**.

Var. **biaristata** Rendle var. nov.

Spikelets narrow ($1\frac{1}{4}$ line long), gl. II. with an awn nearly $\frac{1}{5}$ the length of that of gl. III., which is often 1 in. or more in length.

Pungo Andongo.—Sandy thickets near the edges of woods hard by the Quilanga road; May 1857. No. **2830**.

Var. **effusa** Rendle var. nov.

Panicle effuse, often large, branchlets capillary, flexuose, spikelets small (not exceeding $\frac{3}{4}$ line in length), long-stalked, more oval than in the type with glumes broader in proportion to their length; gl. III. oval with a long capillary awn.

Pungo Andongo.—Common in sandy wooded places near Luxillo and Cazella; May 1857. No. **2831**.

Golungo Alto.—A grass conspicuous for its beautiful violet-red spikelets, in poor soil in sunny places near Cambondo; June 1855. No. **2958**. No. **2973** (no information).

2. **M. angolensis** Rendle sp. nov.

Habit of *M. minutiflora*, culms stoutish, cylindrical, closely enveloped in the lower half by the hairy sheaths; leaves lanceolate, acute, stiff, spreading; panicle dense, lanceolate; spikelets glabrous, $1\frac{1}{3}$ line long; lowest barren glume very minute; gl. II. ovately-oval, convex, with 7 well-marked nerves, midrib carinulate, prolonged into a short weak awn between the short rounded apical lobes; gl. III. slightly shorter and narrower than gl. II., 7-nerved, apex emarginate, unawned, with a narrow hyaline pale and a ♂ flower; fertile gl. slightly shorter, hyaline, ovately oval, very inconspicuously 5-nerved, apex emarginate, with a similar subequal blunt pale.

Shoots 3 ft. long, unbranched except at the lower nodes; internodes with sheath, 1 line in diameter, 1 to $1\frac{1}{2}$ in. long in lower half of shoot, becoming longer (3 to 5 in.) below the inflorescence; nodes where exposed shortly hairy; sheaths with stiffish white hairs from a reddish-brown tubercle; ligule a dense ridge of whitish hairs about 1 line long; blade $1\frac{3}{4}$ to 3 in. long, $3\frac{3}{4}$ to 5 lines broad, base rounded, tapering above to a long point, flattened, surface glabrous, margin sparsely ciliate. Panicle 5 in. long by 1 in. greatest breadth a little above the base, branches alternate except at the base, the lower $1\frac{1}{4}$ to 2 in. long, sharply ascending; spikelets shortly stalked, crowded on the short branchlets; gl. I. $\frac{1}{12}$ line long, semicircular with a fringe of hairs at its base; gl. II. $1\frac{2}{3}$ line, apex shortly bifid, membranous between the prominent parallel nerves; gl. III. $1\frac{1}{4}$ line, oval, more membranous than

gl. II., margin as in gl. II. minutely ciliate above the middle, pale scarcely 1 line; fertile gl. 1 line.

Distinguished from *M. minutiflora* by its larger spikelets, the awned second and blunt third barren glume, and the presence of a ♂ flower in the axil of the latter.

Pungo Andongo.—Called by the colonists *Capim de Caralla*. Lofty mountains at Pedra de Cabondo in the præsidium; middle of April 1857. No. **2819**.

3. **M. Welwitschii** Rendle sp. nov.

Widely cæspitose, culms tough, slender, geniculate, decumbent-ascending, internodes except the uppermost short, pubescent, generally enveloped by the scabridulous-pubescent sheaths; ligule pilose; blades spreading, shortly linear-lanceolate, apex acute, subpungent, pilose, margin scabridulous-pilose; panicle small, narrow, rhachis, branches and pedicels flexuose, hirsutulous; spikelets shortly-stalked, $1\frac{1}{2}$ line long, outline elliptical before spreading; glume I. reduced to an inconspicuous amplexicaul ridge of hairs; gls. II. and III. subequal, convex, coriaceous, 7-nerved, lateral nerves parallel and ceasing at the shortly bilobed apex, keel minutely scabridulous, margin ciliolate especially in the upper portion, gl. II. subovate when flattened, bearing a slender awn from the sinus 3 times its length, gl. III. narrower, less tough, mucronate, enclosing a slightly shorter broad hyaline pale; fertile gl. shorter, thinly coriaceous, elliptical, with truncate mucronulate apex, 5-nerved; pale subequal and narrower.

Described from a single branched spreading shoot less than $1\frac{1}{2}$ ft. high; internodes except the flowering $\frac{3}{4}$ to $1\frac{1}{2}$ in. long, not exceeding $\frac{3}{4}$ line in thickness, terete, reddish; sheaths the same length or slightly shorter; ligule a row of hairs about 1 line long; blades 1 to 2 in. long by 3 to 5 lines broad. Panicles $2\frac{1}{2}$ in. long by about $\frac{1}{2}$ in. or less in width, branches solitary, short, ascending to suberect; pedicels bearing a ring or tuft of stiff whitish hairs just below the joint reaching to about the middle of the light-coloured spikelet. Gls. II. and III. the length of the spikelet; fertile gl. smooth, with convolute margins and rounded back, scarcely exceeding 1 line in length.

Is nearest to *M. angolensis*, but evidently a smaller plant, distinguished by its stronger spikelets with the obsolete lowest glume, and finely awned second glume.

Pungo Andongo.—A widely cæspitose grass, rarely flowering. On the most lofty rocks of the præsidium; Apr. 1857. No. **7390**.

4. **M. tomentosa** Rendle sp. nov.

Culms much branched, spreading, ascending from a creeping base; internodes strong, slender, terete, crimson, short, enveloped by the subequal hirsute sheaths; ligule a row of whitish hairs; blades flat, linear-lanceolate from a cordate base, acute, margin strong, hirsutulous, faces more or less sparsely pubescent, glabrescent in the upper leaves; panicle small, dense, narrowly oblong, rhachis and solitary ascending branches pilose; spikelets

shortly stalked, with a dense crimson tomentum, $1\frac{1}{3}$ to $1\frac{1}{2}$ line long; glume I. obsolete; gl. II. ovate with shortly bilobed apex, 7-nerved, veins not anastomosing, back and margin densely hairy, awn less than twice its own length; gl. III. similar but slightly shorter, 5-nerved, broadly oblong-elliptical, mucronate, sheltering a subequal pale with a male flower; fertile gl. ovate, very blunt, 5-nerved, glabrous, subcoriaceous, enclosing a subequal pale and a ♀ flower; seed narrowly ellipsoidal.

Widely spreading culms up to 2 ft. (perhaps longer), internodes increasing upwards from about $\frac{2}{3}$ to 2 in. long (not including the flowering one), $\frac{2}{3}$ line or less in diameter, puberulous below the tomentose nodes, otherwise glabrous. Ligule about 1 line long; blades 1 to $1\frac{1}{2}$ in. long, 2 to 4 lines broad. Panicle 2 in. or less in length, by $\frac{1}{2}$ line or less in width, branches and pedicels deep crimson; spikelet surrounded by a basal tuft of hairs borne just below the joint, less than the length of the spikelet; gl. I. represented only by a shortly-hairy rudiment; gl. II. the length of the spikelet, awn a little over 2 lines long; gl. III. a little over 1 line long; fertile gl. barely 1 line; seed $\frac{3}{4}$ line long.

Is most nearly allied to the last species, but distinguished by its membranous densely tomentose glumes.

Pungo Andongo.—On the lofty rocks of Pedra Cabondo; Apr. 1857. No. **2717**.

The following probably belongs to the genus, but no flowers are present:—

Pungo Andongo.—A widely cæspitose plant 2 to 3 ft. high with branched ascending culms. Affords excellent fodder, especially for solid-hoofed cattle. On the grassy slopes of the rocks of the præsidium (Pedra de Cazella); 18 Dec. 1856. No. **2761**. Native name Calanga luximba.

### Tribe iv. *AGROSTIDEÆ*.

#### Subtribe I. *Stipeæ*.

#### 32. **ARISTIDA** L.; Benth. & Hook. f. Gen. Pl. iii. p. 1140.

##### Sect. 1.—Chaetaria.

1. **A. Adscensionis** L. Sp. Pl. p. 82 (1753); Durand & Schinz. Consp. Fl. Afr. v. p. 799.

*A. cærulescens* Desf. Fl. Atlant. i. p. 109, t. 21, fig. 2.

Loanda.—In grassy herb-grown places on gravelly soil in Cazanga Island, somewhat plentiful, but not by any means social; April 1854. No. **7458**. Nos. **2905, 7350** (no information).

Golungo Alto?.—No. **7270** (no information).

Pungo Andongo.—Wooded meadows near Caghuy, and at Catete: Feb. 1857. No. **2779**. Thicket-grown meadows in the præsidium: Feb. 1857. No. **2789**.

2. **A. Welwitschii** Rendle sp. nov.

Perennial, habit of *A. Adscensionis* but with a gracefully flexuose, more supple, denser panicle; pedicels shorter than the spikelets, like the rhachis and branches hispidulous, spikelets

narrow, subulate before the divergence of the barren glumes, pale greenish; gl. I. narrowly lanceolate-acuminate, 1-nerved, keel hispidulous, with an awn $\frac{1}{3}$ its length; gl. II. linear, 1-nerved, narrowing to the blunt apex, which passes abruptly into a short awn $\frac{1}{6}$ the length of the glume, back not keeled, glabrous; gl. III. with a short shortly hairy callus, linear-oblong, convolute, 3-nerved, nerves scabridulous, passing above into a narrow-linear 3-nerved stipe to the 3-branched awn; awn-branches very slender, the median about $\frac{1}{3}$ longer than the lateral.

Plants 2 ft. or more in height; roots strong, tough; culms and suberect branches smooth, terete, wiry, nodes glabrous; sheath closely surrounding the internodes, glabrous, except for a few hairs at the mouth, ligule very short ($\frac{1}{4}$ line), truncate, membranous; blades convolute, very slender, long, stiff, wiry, tapering to a fine point, glabrous, reaching over a foot in length. Panicle 4 to 8 in. long, branches slender, suberect, pedicels of spikelets $\frac{1}{2}$ to $1\frac{1}{2}$ lines long; gl. I. including awn 2 lines long, gl. II. $3\frac{1}{4}$ lines, gl. III. slightly longer, $3\frac{1}{2}$ lines, not including the callus ($\frac{1}{4}$ line), to the point of branching of the awn; middle awn-branch $\frac{3}{4}$ in., lateral branches $\frac{1}{2}$ in.

Near *A. Adscensionis* but distinguished by its awned barren glumes and inflorescence characters. Apparently (e descript.) near *A. alopecuroides* Hack. in Abh. Bot. Ver. Brandenb. xxx. p. 144, from Amboland, which however has a spike 20 cm. long, an awn-stipe 6 mm. long, and 4 to 5 times twisted, and linear-acuminate leaves 2 to 3 mm. broad at the base.

Golungo Alto ?.—No. **7255** (no information).

Pungo Andongo.—Monstrous. Meadows near Bumba and N-billa; March 1857. No. **7437**. Specimens not in flower but apparently conspecific with the above.

Var. **minor** Rendle var. nov.

Plants smaller (10 to 15 in.), panicle shorter and stiffer (2 to 3 in. long), barren glumes often pinkish, the outer broader and more abruptly awned than in the type.

Golungo Alto.—Native name Quipusu. Widely cæspitose in the higher thicket-grown pastures. Sobato de Bumba; 12 Oct. 1855. Used for brooms. No. **7235**. A stiff widely cæspitose grass forming the mountain meadows, and making the higher slopes very slippery. Rather plentiful in the higher parts of the Alto Queta mountains; May 1855. No. **7273**.

The following specimens without flower probably belong to this neighbourhood:—

Pungo Andongo.—A singular grass; used for wickerwork. Without flower, and with culms already destroyed, growing intermingled with sods of a tall robust *Ascolepis*, near Condo; March 1857. No. **6945**. At the foot of the pasture-hills near Bumba; without fl.; March 1857. No. **6945***c*.

3. **A. huillensis** Rendle sp. nov.

Perennial, widely cæspitose, culms very slender, erect, fastigiately branched, nodes glabrous; leaves short, narrow-linear,

setaceous, becoming convolute, scabridulous, sparsely hairy beneath, ligule obsolete; panicle lax, strict, meagre; pedicels not exceeding the blue-purple spikelet; gl. I. linear-lanceolate, acuminate or tapering to a strongly cuspidate apex, with one strong median nerve, back hispidulous; gl. II. slightly exceeding gl. I., linear-tapering to linear-lanceolate, strongly cuspidate, with a strong median nerve, glabrous; gl. III. oblong, tapering above without articulation into the awn-stipe, 3-nerved, scabridulous, awn stipe several times twisted, panicles generally 3 subequal or the median slightly longer, sometimes with one or two small additional branches.

Plants about 15 in. high; leaves 4 in. long or less, $\frac{1}{2}$ line or less in width. Panicle $2\frac{1}{2}$ to 4 in. long, branches few, generally appressed, not exceeding $1\frac{1}{2}$ to $1\frac{3}{4}$ in. Gl. I. $3\frac{1}{2}$ to 4 lines long; gl. II. $3\frac{3}{5}$ to $4\frac{1}{2}$ lines; gl. III. about $2\frac{1}{2}$ lines, including the shortly bearded callus ($\frac{1}{2}$ line), awn-stipe $2\frac{1}{2}$ to $3\frac{1}{2}$ lines, branches 6 to 8 lines.

A distinct species of this section characterised by its strongly cuspidate subequal barren glumes, and strict meagre panicle.

Huilla.—A barley-like grass, culms suberect, widely cæspitose. Stony precipices at the cataract near Lopollo; 1 Nov. 1859. On the drier rocks at the cataract of Lopollo; April 1860. No. **2691.**

4. **A. rhiniochloa** Hochst. in Flora xxxviii. p. 200 (1855); Durand & Schinz, *l.c.*, p. 808 (*rhinochloa*).

Loanda.—Plentiful in dry places grown with *Euphorbia* near Maianga do Povo, but found only in one locality; 17 May 1854. No. **7360.**

Sect. 2.—Arthratherum.

5. **A. hordeacea** Kunth Rev. Gram. p. 517, t. 173 (1835); Steud. Syn. Pl. Gram. p. 142 (1854); Durand & Schinz, *l.c.*, p. 803.

*A. Steudeliana* Trin. & Rupr. in Mém. Acad. Sci. Petersb. ser. 6. vii. p. 155 (1843); Steud., *l.c.*; Durand & Schinz, *l.c.*, p. 809.

Loanda.—Annual, cæspitose, with a Bromoid habit, violet-purple glumes and yellowish awns. Sandy places, Alto das Cruzes; May 1858. No. **7301.** Nos. **7324, 7336, 7474** (no notes).

6. **A. vestita** Thunb. Prodr. Pl. Capens. p. 19 (1794); Steud., *l.c.*, p. 142; Durand & Schinz, *l.c.*, p. 810.

*Arthratherum vestitum* Nees Fl. Afr. Austr. p. 174 (1841).

Huilla.—Plentiful in grassy thickets among Acanthaceæ between Quilengues and Lake Ivantâla; Feb. 1860. No. **7516.**

The following specimen may belong to this species, but the material is too young for determination.

Huilla.—Wooded meadows on the river Monino; Feb. 1860. No. **2651.**

Sect. 3.—Stipagrostis.

7. **A. subacaulis** Steud. Nomencl. Bot. ed. ii. i. p. 132 (1840), Syn. Pl. Gram. p. 144; Durand & Schinz, *l.c.*, p. 809.

*Arthratherum subacaule* Nees, *l.c.*, p. 180.

Mossamedes.—Annual, densely and widely cæspitose, with a Bromoid habit, culms very lax, decumbent, awns generally purplish. On the sterile heights around the præsidium where Porto de Pinda stands ; 30 August 1859. No. **2612**.

8. **A. papposa** Trin. & Rupr., *l.c.*, p. 173 ; Steud., *l.c.* ; Durand & Schinz, *l.c.*, p. 805.

Loanda.—The appearance of this grass when moved by the wind is that of undulating liquid silver. Plentiful on grassy hills, in rather dry coarse sandy soil, near Quicuxe and Mutollo, tinging wide areas with a shining silver colour (also found near Maianga do Povo) ; May 1854. No. **7456**. Nos. **7356**, **7356***b*, *c*, *d*.

9. **A. prodigiosa** Welw. in Trans. Linn. Soc. xxvii. p. 80, t. 25 (1869) ; Durand & Schinz, *l.c.*, p. 807.

Mossamedes.—1 to 3 ft. high, perennial by a fleshy rhizome, sometimes annual, root-fibres numerous, white, villous, succulent, radical leaves slightly cæspitose, glaucous, filiform, striate, rigidulous, variously falcate, culms unbranched, ascending, glaucous, tinged with dark-purple at the nodes, awns elongated, plumose. Very plentiful in coarse sandy places by the sea to five to six miles from the ocean from Giraûl as far as Bahia dos Tigres below Cabo Negro ; in fl. and fr. almost the whole year. Affords excellent fodder for antelopes, hares, and cattle. Typical form with hirsute glumes. Praia da Amelia ; June 1859. No. **2000***a*. Form with glabrous glumes. Plentiful in sandy valleys between Cazimba and Mossamedes, 4 Sept. ; between Mossamedes and Praia da Amelia, July ; in the sandy, now almost dry, bed of the river Caroca (commonly called Eroque), Cabo Negro, beginning of Sept. 1859. No. **2000***b*. Coll. Carp. 1107 (no notes).

Subtribe II. *Agrosteæ*.

33. **CALAMAGROSTIS** Adans. ; Benth. & Hook. f. Gen. Pl. iii. p. 1150.

1. **C. Welwitschii** Rendle sp. nov.

Perennial (?), culms cæspitose, erect, or base ascending, unbranched, elongated cauline internodes 4, glabrous, subcompressed, the lowest shorter than the loose membranous scabrous sheath, the upper exceeding their sheaths ; nodes glabrous, well-marked ; ligule large, scarious, truncate ; blade flat, linear-tapering, acute, ascending, scabridulous-striate, glabrous ; panicle elongated, narrow, lax, rhachis and branches scabridulous, branches verticillate or fascicled, flexuosely ascending to suberect, filiform, the lower part bare, the upper bearing several shorter densely flowered branchlets ; spikelets on short pedicels ; barren glumes lanceolate, acute, 1-nerved, with scabridulous keel, the lower slightly the longer ; fertile gl. a little less than the upper barren gl., ovate, truncate, 4-nerved, glabrous, unawned, enveloped by a tuft of hairs almost equal to it in length borne by the callus, enclosing a similar but narrower pale ; anthers 3, pale brown, apiculate.

Plants 2 ft. or a little more in height ; elongated internodes increasing upwards 1½ to 5 in., reaching 1 line in width, with leaf-sheaths a little over 1 to 3½ in. ; ligule 2 to 2½ lines ; blades 2½ to 4½ in. long by 1½ line or less in width. Panicle

reaching 1 ft. in length, $\frac{3}{4}$ in. across, branches $2\frac{1}{2}$ in. long or shorter; pedicels 1 line or less in length; lower barren gl. $1\frac{2}{3}$ line long, upper about $1\frac{1}{4}$ line; fertile gl. a little over 1 line; anthers $\frac{2}{3}$ line.

An interesting species with the habit of *Agrostis*, recalling some effuse forms of *A. alba* L. It is placed in *Calamagrostis* owing to the tuft of hairs on the callus almost equal in length to the glume, but is one of those species which connect the two genera. It is most nearly allied to *C. tenella* Host, which, however, has a shorter-haired callus and an awned flowering glume.

Huilla.—In thicket-grown marshes near Catumba; April 1860. No. **2629**.

34. **POLYPOGON** Desf.; Benth. & Hook. f. Gen. Pl. iii. p. 1150.

1. **P. monspeliense** Desf. Fl. Atl. i. p. 67 (1798); Steud. Syn. Pl. Gram. p. 184 (1854); Durand & Schinz, Consp. Fl. Afr. v. p. 825.

Mossamedes.—Showing little or no difference from specimens from Southern Europe, Syria, Abyssinia, Ceylon, New Orleans, Chili and the Cape. Damp sandy places on the banks of the river Caroca near Cabo Negro; beginning of Sept. 1859. No. **2619**. In small woods of *Tamarix gallica*, species of *Acacia* and *Cordia*, near the banks of the river Maiombo at Pedra do Rei; Oct. 1859. No. **2618**. Annual, with a very fibrous root, widely cæspitose, with many prostrate-ascending or obliquely erect, long-sheathed culms, leaves flat, ligule large, torn at the top, inflorescence yellow-purplish. Plentiful in sandy places on the banks of the river Bero near Cavalheiros; 22 Aug. 1859. No. **2620**.

Subtribe III. *Sporoboleæ*.

35. **SPOROBOLUS** R. Br.; Benth. & Hook. f. Gen. Pl. iii. p. 1148.

1. **S. robustus** Kunth Rev. Gram. p. 425, t. 126 (1829-35); Benth. in Hook. Niger Fl. p. 564 (1849); Durand & Schinz, Consp. Fl. Afr. v. p. 823.

*Vilfa robusta* Steud. Syn. Pl. Gram. p. 154 (1854).

Island of St. Vincent, Cape Verde Is.—Near Porto Mindello; Sept. 1853. No. **2923**.

Loanda.—A fine widely cæspitose grass 2 to 6 ft. high, culms ascending, geniculate, branched, nodes purplish, the lower sending out roots; spikes whitish. Sandy places by the sea near Cabo Lombo; 30 April 1854. No. **7351**. Plentiful in rather damp places round ponds near Imbondeiro dos Lobos; May 1854 and 1858. No. **7294**. No. **7357** (no information).

Bengo.—On the river Bengo near Porto Rei; not in good fl., Dec. 1853. No. **7450**.

Mossamedes.—4 to 6 ft. high, very densely cæspitose, rigid, very rough, culms sometimes straight, sometimes oblique; panicles pyramidal. It is this grass particularly which in company with *Arundo spinosa* renders solid the soil at the mouth of the river Bero, and so makes possible the culture of the gardens. Very plentiful on the banks of the river Bero; 11 Aug. 1859. No. **2296**.

2. **S. pyramidalis** Beauv. Fl. Owar. ii. p. 36, t. 80, fig. 1 (1816-18); Benth., *l.c.*, p. 565; Durand & Schinz, *l.c.*

*Vilfa pyramidalis* Steud., *l.c.*, p. 155.

PRINCE'S ISLAND.—Thicket- and forest-grown hills by the sea near Porto de San Antonio ; Sept. 1853. No. **2931**.

GOLUNGO ALTO.—Poor grassy places near Sange ; Dec. 1855. No. **2977**.

PUNGO ANDONGO.—2 to 3 ft. high, cæspitose. Marshy places near Lombe ; March 1857. No. **2727**. No. **2851** (no information).

3. **S. virginicus** Kunth, *l.c.*, p. 67; Benth., *l.c.*, p. 564 ; Durand & Schinz, *l.c.*, p. 824.

*Agrostis virginica* L. Sp. Pl. p. 63 (1753). *Vilfa virginica* Beauv. Agrost. p. 16 (1812); Steud., *l.c.*, p. 157.

AMBRIZ.—Plentiful at the mouth of the river Loje near Ambriz, growing in coarse sandy and flooded saline places not far from lagoons: Nov. 1853. Nos. **2890**, **2888**.

LOANDA.—Growing socially on the margins of mangrove swamps (Rhizophoreta) Cazanga Island in damp saline ground (and everywhere on the shore of the ocean wherever the ground is tolerably damp) ; end of April 1854. No. **7459**. Sandy shores of Cazanga Island ; May 1854. Nos. **7302**, **7369**.

MOSSAMEDES.—Places grown with short thickets near the sea and flooded in the rainy season not far from Mossamedes ; July 1859. No. **2611**.

4. **S. spicatus** Kunth, *l.c.* ; Durand & Schinz, *l.c.*, p. 823.

*Agrostis virginica* Forsk. Fl. Æg.-Arab. Descr. p. 20 (1775).

*A. spicata* Vahl Symb. i. p. 9 (1790). *Vilfa spicata* Beauv., *l.c.* ; Steud., *l.c.*, p. 160.

ISLAND OF ST. VINCENT, CAPE VERDE IS.—Coarse sandy places and barren hills ; Sept. 1853. No. **2921**.

5. **S. festivus** Hochst. ex A. Rich. Tent. Fl. Abyss. ii. p. 398 (1851) ; Durand & Schinz, *l.c.*, p. 820.

*Vilfa festiva* Steud., *l.c.*, p. 158.

PUNGO ANDONGO.—A very elegant cæspitose annual(?); culms erect, striate ; panicle a fine violet. Plentiful in damp, sunny, rocky places. Rocks of Cabondo : towards the end of Nov. 1856. No. **2751**. Beginning of Nov. No. **2751*b***. Agrostoid or simulating *Aira*, cæspitose, 1 to 1½ ft. high, remarkable when alive for its amethyst-purple spikelets. Pastures of short grass between the præsidium and Luxillo ; May 1857. No. **2804**.

6. **S. Welwitschii** Rendle sp. nov.

Perennial by a short rather slender ascending rhizome, which bears very short densely cæspitose leaf-shoots, with small, stiff, involute, acicular, pungent, glabrous, crowded leaves, sheaths membranous, striate, glabrous, pilose only at the mouth; flowering culms slender, wiry, slightly geniculate, nodes glabrous, leaf-sheaths much shorter than the internodes, leaves short, distichously spreading, similar to those on the leafy shoots, ligule a short densely hairy ridge ; panicle ellipsoidal, effuse, branches alternate, slender, spreading, branchlets capillary, spreading nearly at a right angle, similarly branched, interlacing, and forming a fine capillary network with thickened nodes, nodes

with 1 to 3 long fine hairs; pedicels long, clavately swollen beneath the spikelet; spikelets fuscous, a little over $\frac{1}{2}$ line long, lanceolate becoming truncate-elliptical-oblong, barren glumes blunt, enerved, glabrous, membranous, the outer less than half the length of the spikelet, orbicular-ovate, the inner elliptical; fertile glume broadly ovate, blunt, roundly convex, with a central nerve and two short submarginal lateral nerves, glabrous, pale subequal or slightly longer, broadly elliptical-obovate, very blunt; anthers 3.

Plants 9 to 14 in. high, the slender erect culms, with 4 to 5 nodes, rising from crowded leafy tufts 1 to $1\frac{3}{4}$ in. high; leaves not exceeding 1 in., generally less, sheaths $\frac{1}{2}$ to 1 in., the uppermost $1\frac{1}{2}$ to 2 in.; ligule less than $\frac{1}{4}$ line. Panicle $2\frac{1}{2}$ to $3\frac{1}{2}$ in. long by 1 to 2 in. broad, branches reaching $1\frac{1}{2}$ in. long, becoming shorter above the middle, branched again from the base, pedicels 2 to 4 times as long as the spikelet. Glume I. scarcely $\frac{1}{4}$ line long, gl. II. a good $\frac{1}{3}$ line, gl. III. a good $\frac{1}{2}$ line, pale similar in texture and fuscous-green colour to the glume, upper margin membranous, very minutely ciliolate; anthers scarcely $\frac{1}{2}$ line.

Near *S. minutiflorus* Link, but distinguished by habit, short pungent leaves, and small capillary reticulate pilose panicle.

Huilla.—Poor pastures in the Lopollo district; May 1860. No. **2690**.

7. **S. andongensis** Rendle sp. nov.

Perennial, widely and densely cæspitose, leaf-shoots and erect culms springing from the massed withered leaf-sheaths; leaves suberect or ascending, rigidulous, linear, tapering to a pungent apex with strong submarginal nerves, sparsely pilose on the upper face; nodes glabrous; sheaths with ciliolate margin and pilose mouth; ligule short, densely hairy; panicle more or less ellipsoidal; branches alternate, subascending, branchlets spreading at about 45°, capillary, like the pedicels, nodes swollen and bearing tufts of hairs, pedicels 2 to several times as long as the spikelets, clavate at the tip, spikelets fuscous, lanceolate to oblong, $\frac{3}{4}$ line long; barren glumes subequal, blunt, the outer ovate, 1-nerved, the inner elliptical, enerved; fertile glume ovate, blunt or emarginate, 3-nerved, the lateral nerves falling short of the tip; pale slightly longer, elliptical, glabrous; anthers 3.

Plants 7 to 11 in. high; leaves to 3 in. long, about 1 line or less in breadth at the base; ligule $\frac{1}{4}$ line; culms with 3 to 4 internodes, slender. Panicle diffuse, to 4 in. long by $1\frac{1}{2}$ in. broad, branches reaching $1\frac{1}{2}$ in. Barren glumes of spikelets between $\frac{1}{3}$ and $\frac{1}{2}$ line long, fertile glume a good $\frac{2}{3}$ line, pale similar in colour and texture, $\frac{3}{4}$ line; anthers scarcely $\frac{1}{2}$ line long.

Near the last species, but distinguished by its larger spikelets, subequal barren glumes, and linear-tapering leaves.

Pungo Andongo.—Perennial, widely and densely cæspitose, leaves and culms erect, panicle diffuse. Wet meadows between Candumba and Lombe, growing with *Lythraceæ*, etc.; March 1857. No. **2812**.

8. **S. pulchellus** R. Br. Prodr. p. 170 (1810); Kunth Rev. Gram. p. 419, t. 123.

*Vilfa pulchella* Steud., *l.c.*, p. 155.

Pungo Andongo.—Annual, laxly cæspitose, a span to a foot high, culms erect, slender, branched, spikes whorled, spikelets purplish. Damp sandy soil between the bridge of Luxillo and Cambambe; Feb. 1857. No. **2809**. Plentiful in rather damp places by the sandy roadside between Candumba and Lombe; March 1857. No. **2805**. Damp places, Lombe; March 1857. No. **2720**.

9. **S. Molleri** Hack. in Bol. Soc. Brot. v.p. 213 (1887); Durand & Schinz, *l.c.*, p. 822.

Golungo Alto.—Growing in dense masses, but not cæspitose; pleasing to cattle. Plentiful in sparsely grassed sunny places in poor soil near Sange (Caminho, near Bango); Dec. 1854. No. **2984**.

Pungo Andongo.—No. **2843** (no notes).

10. **S. sanguineus** Rendle sp. nov.

Apparently annual, cæspitose, culms tall, erect, unbranched, distichously sheathed at the base; nodes purplish, glabrous; cauline internodes 4, subcompressed, glabrous, long and, including the lowest, exceeding the long appressed membranous sheaths, mouth pilose, margins pilosulose in the upper part of their length; ligule short, hairy; blade long, linear, tapering above to a setiform apex, glabrous, plicate to convolute, ascendo-patent to suberect; panicle immature, long, strict, dense, glabrous, rhachis slender, branches filiform in whorls of 7 or fewer, at present ascending, bearing in the upper part short 2- to 3-flowered branchlets; spikelets dark crimson, lanceolate and acute before opening, shortly stalked; barren glumes glabrous, lanceolate, acute, very unequal, the lower small, narrow, enerved, barely $\frac{1}{5}$ the length of the spikelet, the upper the length of the spikelet, 1-nerved; fertile glumes similar to, but slightly shorter and less sharply pointed than the large barren glumes, pale subequal and similar but elliptical with truncate apex; lodicules cuneate with retuse apex; anthers 3, yellowish, linear; styles bifid, glabrous, bearing a pair of large plumose stigmas.

Culms over 3 ft. in height, the three lower internodes of the longest measuring 5, 5, and $9\frac{1}{2}$ in. respectively, the lowest 1 line across. Ligule less than $\frac{1}{3}$ line long; blades reaching 1 foot in length, and 2 lines greatest width, those on the young leaf-shoots narrower. Panicle 9 in. long, $\frac{1}{2}$ to $\frac{2}{3}$ in. in diameter; branches 2 in. or less; spikelets $1\frac{3}{4}$ to barely 2 lines long; anthers $1\frac{1}{5}$ line.

Closely resembles the North-American *S. junceus* Kunth in habit and characters of the spikelet; but is evidently a larger plant with stricter panicle. From the description apparently near *S. Rehmanni* Hack. (Transvaal), which resembles it in the characters of the spikelet but has lanceolate-linear leaves with a rounded base.

Huilla.—In poor thicket-grown meadows in the Lopollo territory; May 1860. No **2660**.

Subtribe IV. *Phleoideæ.*

36. **HELEOCHLOA** Host; Benth. & Hook. f. Gen. Pl. iii. p. 1146.

1. **H. schoenoides** Host Gram. Austr. i. p. 23, t. 30 (1801) Durand & Schinz, Consp. Fl. Afr. v. p. 815.

*Crypsis schoenoides* Lam. Ill. i. p. 166 (1791); Steud. Syn. Pl. Gram. p. 152 (1854).

Mossamedes.—A prostrate highly social grass, occupying exclusively large tracts of muddy land. On the marshy banks of the right branch of the river Caroca, near Cabo Negro, also at Porto de Pinda; sometimes with species of *Arthrocnemum* and *Lippia nodiflora*; 3 Sept. 1859. No. **2622**.

Tribe v. *ZOYSIEÆ.*

37. **NAZIA** Adans. Fam. ii. p. 31 (1763).

*Tragus* Hall. Stirp. Helv. ii. p. 203 (1768); Benth. & Hook. f. Gen. Pl. iii. p. 1122.

1. **N. racemosa** O. K. Rev. Gen. Pl. p. 780 (1891).

*Cenchrus racemosus* L. Sp. Pl. p. 1049 (1753). *Lappago racemosa* Honck. Syn. i. p. 440 (1792); Benth. in Hook. Niger Fl. p. 564 (1849); Steud. Syn. Pl. Gram. p. 112 (1854). *Tragus racemosus* Scop. Introd. p. 73 (1777).

Loanda.—An annual grass, a span high, culms laxly cæspitose, spikes ascending like a *Myosurus*, straight, spikelets sticky, echinate on all sides. Habit almost as in *Lappago racemosa* of Europe, and probably the very same plant. On low red-sandy hills above Loanda, Alto das Cruzes, but not plentiful; Dec. 1858. No. **7313**. Common in sandy ground near Penedo: Jan. 1859. No. **2910**. 1853-4. No. **7373** (in part). Nos. **7345**, **7464** (no information).

38. **MONELYTRUM** Hack. in Abh. Bot. Ver. Brandenb. xxx. p. 140 (1888).

1. **M. Luderitzianum** Hack., *l.c.*; Durand & Schinz, Consp. Fl. Afr. v. p. 733.

Mossamedes.—In sandy places by the sea at the mouths of the river Bero but apparently somewhat rare; July 1859. No. **2292**.

The leaves are shorter and broader than in the type as described by Hackel showing a tendency to linear-lanceolate; they measure $\frac{3}{4}$ to $1\frac{3}{4}$ in. in length by 1 to 2 lines in breadth.

39. **PEROTIS** Ait.; Benth. & Hook. f. Gen. Pl. iii. p. 1123.

1. **P. latifolia** Ait. Hort. Kew. i. p. 85 (1789); Benth. in Hook. Niger Fl. p. 569 (1849); Steud. Syn. Pl. Gram. p. 186 (1854); Durand & Schinz, Consp. Fl. Afr. v. p. 734.

*Saccharum spicatum* L. Sp. Pl. p. 54 (1753).

Pungo Andongo.—Annual, 2 to 3 ft., cæspitose, leaves rigidulous, glaucous, more or less undulate, spike a foot or more long, with the appearance of a violet feather, floating very gracefully among the common grasses. Gravelly and rocky places on the banks of the Cuanza; Jan. 1857. No. **2740**. Annual, laxly cæspitose, very graceful,

culms ascending, distichously leaved, distantly sheathed above, spikes barley-like, shining whitish-yellow, barbs spreading at mid-day, bur soon contracted. Plentiful in sandy wooded places between Sansamanda and Mopopo on the right bank of the Cuanza; April 1857. No. **7424**. Panicle narrowed in the day-time expanded in the evening. Common in sandy woody places near Sansamanda; 1 May 1857. No. **2732**.

Huilla.—A cæspitose grass, culms prostrate to ascending, spikes *Myosurus*-like purplish. Very common on low thicket-grown sandy hills round edges of woods near Monino; April and May 1860. No. **7488**.

### Tribe VI. *AVENEÆ*.

40. **AVENA** L.; Benth. & Hook. f. Gen. Pl. iii. p. 1160.

1. **A. uniflora** Parl. Pl. Nov. v. Min. Not. p. 84 (1842); Webb & Berth. Hist. Nat. Canar. iii. p. 401, t. 248; Steud. Syn. Pl. Gram. p. 231 (1854); Durand & Schinz, Consp. Fl. Afr. v. p. 843.

Huilla.—Sandy thickets near the banks of the river Monino, but rarely met with; April 1860. No. **7509**.

41. **DANTHONIA** DC.; Benth. & Hook. f. Gen. Pl. iii. p. 1162.

1. **D. Forskälii** R. Br. in Denham & Clapp. Trav. & Disc. in N. & Centr. Afr. App. p. 244 (1826); Trin. Gram. Icon. & Descr. i. t. 49 (1828); Steud. Syn. Pl. Gram. p. 244 (1854); Durand & Schinz, Consp. Fl. Afr. v. p. 850.

*D. glauca* Nees Fl. Afr. Austr. p. 327 (1841).

Mossamedes.—Coarse sandy places near the sea, to the south of Mossamedes, but rather rare. Praia da Amelia; July 1859. No. **2294**.

2. **D. mossamedensis** Rendle sp. nov.

Perennial by a stout woody rhizome, culms erect or subascending below, unbranched, suffruticose; leaf-sheaths striate, glabrous below, becoming scabridulous above, shorter than the densely, shortly pubescent internodes; nodes reddish, glabrous; ligule short, densely hairy; blades about equal to or slightly exceeding the sheaths, linear-tapering, becoming convolute, apex setaceous, more or less scabridulous on the lower, striate and sparsely shortly pilose on the upper face; panicle strict, interrupted, branches short, suberect, densely spiculiferous to the base, rhachis, branches, and pedicels shortly pubescent; spikelets $\frac{3}{4}$ in. long, barren glumes subequal, exceeding the flowers, lanceolate, acute, rigidulous, membranous, 9- and 7-nerved, flowers 6, becoming smaller upwards, rhachis-joints obliquely acute, lowest fertile glume elliptical, concave, 7-nerved, bilobed at the apex, lobes weakly setigerous, bearing a dorsal line of dense white hairs about $\frac{1}{3}$ below the tip; pale much flattened, nerves strong, minutely ciliolate, ovary glabrous.

Plants 2 to $2\frac{1}{2}$ ft. high; root-fibres stout; leaf-sheaths, except the uppermost (5 in.), $1\frac{1}{2}$ to $3\frac{1}{4}$ in. long, blades $\frac{3}{4}$ to $3\frac{1}{2}$ in. long, 1 to $1\frac{1}{2}$ lines broad at the base, ligule $\frac{3}{4}$ line long. Panicle 6 to 9 in. long, 1 in. or less across, lowest branches $1\frac{1}{2}$ to $1\frac{3}{4}$ in. long,

the upper gradually shorter. Spikelets ascending, rhachis-joints brittle, shortly puberulous, barren glumes glabrous, the lower slightly (less than $\frac{1}{2}$ line) longer than the upper, 9-nerved below, becoming 5-nerved near the apex, the upper 7-nerved below, all the nerves except the median becoming indistinct above. Lowest flowering glume 3 lines long without the awn, rhachis-joint $\frac{3}{4}$ line, awn 7 lines, including the flattened column ($1\frac{3}{4}$ line), lateral nerves conspicuously green below the tip, lobes very delicate, ridge of hairs white, exceeding the glume; pale scarcely 3 lines; lodicules rather large, cuneiform, anthers 2 lines long.

Near the last species, but a much larger plant, distinguished by its long strict interrupted panicle, its larger spikelets, etc.

Mossamedes.—A suffruticose, triticiform, pale green grass; culms and rhachis brittle. Growing with *Vogelia africana* Lam. in coarse sandy places near Cavalheiros on the river Onco, and by the river Bero in rather dry places; July 1859. **No. 2282.**

3. **D. andongensis** Rendle sp. nov.

A very elegant widely cæspitose glabrous perennial; rhizome strong, densely fibrous; culms springing from among the closely massed last year's sheaths, slender, erect; leaves almost as long as the culms, erecto-ascendent, rigid, apex pungent, in the dried specimens convolute and subulate, when alive flat linear-lanceolate, or broadly linear-acuminate, shining glaucous yellowish-green; ligule a low ridge of white hairs; blade sharply separated from the sheath; panicle linear at first, becoming irregularly rhomboidal, branches fastigiate at the nodes, ascending, young spikelets lanceolate, about 5-flowered, lowest flower ♂ with a shortly imperfectly awned glume, the upper ♀ with a perfect awn slightly exceeding the length of the glume; barren glumes shorter than the spikelet, subelliptical, acute, conspicuously 3-nerved, setigerous, gl. III. more ovate, with a slightly bifid apex, gls. IV. and V. subequal, 5-nerved, elliptical, the lateral nerves produced into the two acute shortly setiferous membranous lobes, callus short, bearing lateral tufts of short whitish hairs, succeeding glumes becoming shorter.

Plants 1 to $1\frac{3}{4}$ ft.; basal leaf-sheaths $1\frac{1}{2}$ to 3 in. long, membranous, culms with 4 internodes; cauline sheaths subequal to or shorter than the leaf-sheaths; leaves reaching 10 to 12 in. in length, and 2 lines in breadth when flattened; ligule scarcely $\frac{1}{3}$ line long. Panicle about 6 in. long by $1\frac{1}{2}$ broad when mature; branches reaching 3 in.; spikelets shortly stalked or terminal, reaching $\frac{1}{2}$ in. in length, like the rest of the plant glabrous; lower barren gl. slightly oblanceolately elliptical, $2\frac{2}{3}$ to $3\frac{1}{4}$ line including the short awn ($\frac{1}{3}$ to $\frac{2}{3}$ line); gl. II. separated by a short internode, more elliptical than gl. I., about 3 lines long, including the awn ($\frac{1}{2}$ line); gl. III. subsessile, very slightly exceeding gl. II.; pale flattened with strong ciliolate nerves and retuse apex, scarcely $2\frac{1}{2}$ lines long; upper glumes separating from the glabrous rhachis-joint ($\frac{3}{4}$ line long), gls. IV. and V.

3 to 3¼ lines long, awn 3½ to 4 lines, geniculate below the middle with a flat much-twisted column; pale as in the lowest flower; fruit (unripe) narrowly elliptical, glabrous.

Resembles some forms of the American *D. spicata* Roem & Schult, but is distinguished by its long stiff suberect leaves, relatively shorter barren glumes, etc.

Pungo Andongo.—A very elegant grass, apparently flowering only very rarely. When dried the leaves completely lose their form and colour. Plentiful on the rocks of the præsidium; in fl. Nov. 1856. No. **2744**. On the higher rocks of the præsidium at Pedra Cazella, Pungo, and Cabondo; in fl. May 1857. No. **7417**.

42. **PENTASCHISTIS** Stapf in Fl. Capens. vii. p. 314 (1898); Nees in Lindl. Nat. Syst. ed. ii. p. 382 (1836) as a subgenus. *Danthonia* DC., Benth. & Hook. f. Gen. Pl. iii. p. 1163, pro parte.

1. **P. Welwitschii** Rendle sp. nov.

A widely cæspitose glabrous perennial with a slender fibrous rhizome; culms slender, erect, springing from among the withered basal leaf-sheaths, which ultimately become fibrous; leaves erect, linear, convolute, stiff, subpungent, sometimes overtopping the panicle; ligule a very short ridge of whitish hairs; blade conspicuously jointed to the slender cylindrical striate sheath which far exceeds the very thin terete internodes; panicle graceful, narrowly lanceolate, subnutant; branches slender, ascending, solitary; spikelets terminal, or shortly stalked on the branchlets, small, lanceolate before spreading of the glumes; flowers 2, ♀; barren glumes shorter than the flowers, membranous, 1-nerved, lanceolate, the lower acuminate, the upper slightly larger with an irregularly cut cuspidate apex; flowering glumes subequal, on a very short rhachis-joint, callus short, white-hairy; glume yellowish, ovate, 3-nerved with 2 less prominent partial outer nerves, apex bearing a median awn, and on each side a pair of weak slender setiform lobes; awn weak, geniculate just above the base; pale elliptical, back somewhat flattened, apex shortly weakly trifid, minutely hispidulous.

Plants 1 to 2 ft. high; culms with 3 internodes, the uppermost only escaping from the leaf-sheath; leaves except the younger 8 to 10 in. long, slender and convolute, rarely exceeding ½ line in breadth. Panicle 4½ to 7 in. long, ½ to 1 in. broad, lower branches 1½ to 2 in.; pedicels about equal or a little longer or shorter than the spikelet, like the rhachis and branches glabrous; spikelet, without the awns, about 1¾ line long; lower barren gl. 1 line, the upper 1¼ line; flowering gl. 1 line, the inner setæ 1½ line long, the outer shorter; awn 2¾ lines, kneed ½ line above the base; pale a little shorter than the glume, apex and upper part of nerves minutely hispidulous; ovary glabrous.

A very distinct species approaching *D. abyssinica* Hochst., but distinguished by its lax inflorescence, smaller spikelet, sessile upper flower, 5-nerved flowering glume, etc.

Pungo Andongo.—Widely cæspitose, 1 to 2 ft. high; culms erect

or sometimes patulous; leaves very narrow-linear, bright green, slightly fleshy, soon becoming yellow when dried. On rocks of the præsidium near Cabondo; Feb. 1857. No. **2808**. On the spongy sunny slopes of Tunda-Quilombo; end of May 1857. No. **7419**.

### Tribe VII. *ARUNDINELLEÆ*.

43. **TRICHOPTERYX** Nees; Benth. & Hook. f. Gen. Pl. iii. p. 1162.

1. **T. simplex** Benth. in Journ. Linn. Soc. xix. p. 98 (1881); Durand & Schinz, Consp. Fl. Afr. v. p. 846.

*Tristachya simplex* Nees Fl. Afr. Austr. p. 269 (1841); Steud. Syn. Pl. Gram. p. 238 (1854).

Pungo Andongo.—Called by the negroes Lucomba. A cæspitose grass 3 to 5 ft. high, erect or almost ascending; the tough culms are used by the fishermen for making Musûas (baskets to catch fish). Plentiful in damp meadows from Bumba, Ambuilla, and Condo as far as Quisonde; in fl. and fr. March 1857. No. **7395**. Lombe, in wide shining rather damp meadows; March 1857. No. **2719**. A tall cæspitose *Aristida*-like grass. In wooded pastures between Condo and Quisonde; March 1857. No. **7444**. In the wooded rather deeply grassed meadows of Monino. Collected during the second reconnoitring excursion against the Monani; beginning of March 1860. No. **7495**

Var. **gracilis** Rendle var. nov.

Densely cæspitose, with slender erect culms springing from the fibrous basal sheaths, with a spreading whorl of hairs at the nodes; leaves suberect or ascending, rigidulous, narrow-linear, becoming convolute and setaceous; spikelets glabrous, $4\frac{1}{2}$ lines long; sheaths and leaves glabrous or pubescent, especially in the lower part of the plant.

Pungo Andongo.—On the slopes of Cabindo. No. **2714**. A cæspitose perennial grass, 2 to 3 ft. high, culms erect with spreading hairs at the nodes, panicles somewhat nodding. In boggy places on the rocks above Catete, not fully developed; 28 Feb. 1857. No. **2787**. In meadows near N-billa on the river Cuanza; March 1857. No. **7441**. A slender widely cæspitose erect grass 3 ft. high, with the habit of *Aristida*. Wooded meadows between Candumba and Muta Lucala, and also near Mopopo; March and April 1857. No. **7406**.

(?) Var. **crinita** Stapf ined.

Pungo Andongo.—Wooded meadows between Bumba and Condo; March 1857. No. **7445**.

The spikelets are very young.

2. **T. grisea** K. Schum. in Engl. Pfl. Ost.-Afr. C. p. 109 (1895).

Pungo Andongo.—A cæspitose grass with the habit of *Aristida* or *Stipa*, almost completely villose. Rather rare in wooded meadows between Pedras de Guinga and Candumba; March 1857. No. **7443**. 3 to 4 ft., erect, cæspitose. In thicket-grown secondary woods in the præsidium, but not plentiful; Jan. 1857. No. **2716**. Nos. **2848**, **2867** (no information).

3. **T. densispica** Rendle sp. nov.

Perennial, cæspitose, culms erect, slender, terete, wiry, springing

from among the withered leaf-sheaths of last season and enveloped at the base by a few leaves reduced to the brown membranous sheath or with only a small blade; stem internodes 2 to 3 like the nodes and sheaths glabrous; sheaths cylindrical, close-fitting, much shorter than the internodes; ligule a short dense row of hairs; blades slender, convolute, rigid and setaceous, erect, the uppermost reaching or overtopping the inflorescence, pubescent on the inner face; panicle very dense, spikelike, linear, spikelets subsessile or shortly stalked on the very short appressed compressed branches, lanceolate-subulate, light brown; gl. I. about half as long as gl. III., lanceolate, subacute, 3-nerved, dorsally flattened, margins incurved with a close line of dark brown warts with spreading white bristly hairs; gl. II. linear-lanceolate, acuminate, blunt, 3-nerved, the involute margin minutely scabridulously hairy from below the middle to below the tip; gl. III. exceeding gl. II., linear below, tapering above into an acuminate awn; 3-nerved; pedicel of fertile flower slender, bearing short basal tufts of hair like the callus, fertile gl. coriaceous, puberulous, convolute, inconspicuously 7-nerved with minutely bilobed apex between which springs the long awn; pale linear-tapering, nerves strong, approximate.

Culms $1\frac{1}{2}$ to nearly 2 ft. long, sheathed for about 2 in. at the base, internodes $\frac{3}{4}$ to $\frac{1}{2}$ line in diameter; cauline sheaths 2 to 3 in. long, leaf-blades 3 to 5 in., $\frac{1}{3}$ to $\frac{1}{2}$ line in thickness in their natural convolute condition. Panicle barley-like, $1\frac{3}{4}$ to 3 in. long not including the awns; fully developed spikelets $\frac{3}{4}$ in. long; gl. I. 4 to $4\frac{1}{2}$ lines long, gl. II. $7\frac{1}{2}$ lines or slightly less, gl. III. $8\frac{1}{2}$ to 9 lines, pale 4 lines, narrow, flattened, with a bifid apex; pedicel of fertile flower slender, $1\frac{1}{2}$ line long, exceeding the truncate callus, gl. 3 lines long including callus, column of awn pale brown, twisted, about 1 in. long, subula greenish $1\frac{1}{4}$ to $1\frac{1}{3}$ in. long, pale narrow, $2\frac{2}{3}$ line. The stamens have dropped, but there appear to have been 2 in the ♀ flower.

A distinct species near *T. hordeiformis* Stapf, but differs in its perennial habit, narrow setaceous leaves, glabrous nodes, shorter inflorescence and relative lengths of the glumes.

HUILLA.—In poor sandy thicket-grown pastures near the edges of woods in the Lopollo district; Feb. 1860. No. **7500**.

4. **T. gigantea** Stapf in Kew Bull. 1897, p. 295.

PUNGO ANDONGO.—Deep-grassed wooded thickets between Candumba and Mangue; Feb. 1857. No. **2836**.

HUILLA.—Wooded rocks by Lake Ivantâla; end of Feb. 1860. No. **7525**.

Var. **gracilis** Rendle var. nov.

Culms slenderer than in the type with short narrow-linear tapering involute leaves, and basal sheaths glabrous like the upper; spikelets smaller, 10 to 13 lines long, and gl. I. less robust and generally more acute. Leaves 5 to $1\frac{1}{2}$ in. long, 2 lines or less in breadth.

Pungo Andongo.—4 to 5 ft. high, with an erect, slender, slightly branched culm. Remarkably social. Very plentiful on the rather damp banks of the river Cuanza near Condo, Calemba, etc.; 12 March 1857. No. **7412**. Sandy woods of Leguminosæ; Feb. 1857. No. **2782**.

5. **T. viridis** Rendle sp. nov.

Perennial, cæspitose, culms strong, erect, base subascending, enveloped by the equitant pubescent sheaths of the withering basal leaves; cauline internodes 3, the lowest minutely pubescent, the upper glabrous, except the uppermost longer than the sheaths; nodes densely hairy; ligule a short dense row of whitish hairs; blades linear-lanceolate from a tapering base, acute, margined, midrib conspicuous, lower face pubescent; panicle springing from the uppermost leaf-sheath which reaches to its base, linear or narrowly lanceolate, dense, rhachis and branches pubescent, branches alternate, erect or suberect, secondary branches suberect, subsecund; spikelets terminal, or sessile and shortly stalked in pairs, lanceolate, membranous, yellowish-green tinged with purple, 5 to 6 lines long; gl. I. ovate, blunt, conspicuously 3-nerved, nearly half as long as gl. III.; gl. II. elliptical narrowing above to a long linear blunt tip, conspicuously 3-nerved, exceeding gl. III. which is elliptical narrowing above to a shortly acuminate blunt hyaline apex, 5-nerved, pale flat, hyaline, enclosing a triandrous ♂ flower; gl. IV. on a densely hairy callus, elliptical-ovate, 9-nerved, apex with 2 acute lobes, between which springs an awn twice the length of the glume, the rounded back of the glume bearing just below the middle line eight intervenal tufts of whitish hairs; pale ovate-lanceolate, the 2 veins bearing a circinately incurving keel below the middle line, flower ☿, triandrous, ovary glabrous.

Plants 3 ft. high, with a strong sympodial rhizome; basal sheaths 2 to 4½ in. long, the cauline 5 to 8 in., loosely enveloping the stout, terete internode; blades of basal leaves to 8 in. long by over 4 lines broad, on the culms shorter. Panicle 8 to 10 in., and probably longer, lower branches reaching 5 in. becoming shorter upwards; gl. I. about 2½ lines long, sparsely pubescent near the tip; gl. II. 5 to 6 lines, glabrous; gl. III. 4½ lines, the outermost nerves falling short of the rest, the hyaline apex nerveless, glabrous; pale delicate, 4 lines; gl. IV. about 3½ lines, hairs of callus reaching to the origin of the dorsal tufts, which themselves fall short of the tips of the lateral lobes, the 3 central nerves passing into the base of the awn, the 3 lateral into the lobe; awn 6 to 7 lines long, the pale subula slightly exceeding the brown twisted column; pale 3 lines long, anthers brownish, 2½ lines, lodicules cuneate, between ⅓ and ½ line.

A very distinct species characterised by its greenish membranous spikelets, triandrous flowers, tufted-hairy fertile glume and locally keeled pale.

Huilla.—A cæspitose grass with habit of *Arena*, very much liked by cattle. In rocky, thicket-grown pastures round the great Hippopotamus lake (Ivantàla); Feb. 1860. No. **2633**.

44. **TRISTACHYA** Nees; Benth. & Hook. f. Gen. Pl. iii. p. 1161.

1. **T. biseriata** Stapf in Kew Bull. 1897, p. 295.

Pungo Andongo.—Thicket-grown meadows near Sansamanda; Feb. 1857. No. **2792**. Open sandy woods between Caghuy and Sansamanda; April 1857. No. **7387**.

2. **T. Welwitschii** Rendle sp. nov.

Perennial, culms robust, erect, sheathed at the base, cauline internodes 3, including a short lower one, 2 to 3 times as long as the closely enveloping cylindrical sheaths; ligule a dense row of white hairs; blades narrowly linear-lanceolate or linear-tapering, apex long drawn out, acute, faces roughly striate; panicle narrowly obovoid, branches ascending, purplish, each with one triplet 10 to 11 lines long; spikelets glabrous, gl. I. rigidly coriaceous, golden-yellow, narrowly triangular acute, 3-nerved, flat with narrowly incurved membranous edges; gl. II. longer than gl. I., narrowly lanceolate, acuminate, 3-nerved, margin incurved at the lateral nerves, involute above; gl. III. similar but shorter, 5-nerved above the middle, marginal nerve double, pale lanceolate, about $\frac{2}{3}$ as long as the glume; gl. IV. on a short truncately conical white-haired callus, oblong, 7-nerved, awn $2\frac{1}{4}$ in., kneed below the middle, column twisted, pale linear, nerves strong, closely parallel.

Plants $2\frac{1}{2}$ to 3 ft. high, the lower part of the basal sheaths and the lowest cauline node sparsely pubescent, otherwise glabrous. Leaves 5 to 14 in. long by 2 to 3 lines broad, ligule $\frac{2}{3}$ line long. Panicle 6 to $8\frac{1}{2}$ in. long by 2 in. greatest width, branches 1 to $3\frac{3}{4}$ in. long, 3 to 7 at the lowest node, in pairs or solitary at the next, solitary at the remaining two; triplets 7 to 12. Gl. I. 8 to $8\frac{2}{3}$ lines long, gl. II. 10 to 11 lines, gl. III. 9 lines, pale with conspicuous green nerves and notched apex, anthers 3 lines; gl. IV. on a short glabrous stalk $\frac{3}{4}$ line long, callus 1 line, blade 4 lines to point of divergence of awns, the median and alternate lateral nerves strong, the other four weak, lateral setæ $\frac{1}{2}$ in. long; pale $3\frac{1}{3}$ line, the strong nerves diverging below the rounded emarginate tip, lodicules rather narrowly cuneate, $\frac{1}{2}$ line long, ovary hairy on the top, style-arms hairy.

Near *T. biseriata* Stapf, but distinguished by its habit and glabrous outermost glume.

Huilla.—Thicket-grown sandy meadows in the Lopollo district; April 1860. No. **2677**.

3. **T. inamoena** K. Schum. in Engl. Pfl. Ost-Afr. C., p. 109 (1895).

Pungo Andongo.—A cæspitose erect grass 4 to 5 feet high. Plentiful in Panda forests, near Condo; 3 March 1857. No. **7400**.

Huilla.—Wooded meadows of Monino but plentiful in only one locality, very rare elsewhere; April, May, 1860. No. **2692**.

4. **T. huillensis** Rendle sp. nov.

Perennial with a slender ascending rhizome; glabrous; culms densely cæspitose, shortly stoloniferous at the base, erect, clothed below with the withered leaf-sheaths, cauline leaves 2, sheaths

membranous, several times shorter than the much elongated slender terete internodes; ligule a dense row of very short whitish hairs; blades convolute, setaceous, erect, shorter than the internodes; panicle subnutant, often subumbellate, branches slender, wiry, flexuose, bearing 2 or 3 golden-brown spikelets which are 5 lines long without the awn; outer glumes equal, the length of the spikelet, membranous and acuminate in the upper third, the lower lanceolate, tuberculate and bristly on the lateral nerves, the upper elliptical, glabrous; gl. III. elliptic-oblong, tapering above to the minutely apiculate apex, 3-nerved, one or both lateral nerves with a few small bristle-tubercles about the middle, fertile gl. on a slender long-haired callus, involute, when flattened oblong from a truncate base narrowing at the apex, 7-nerved, awn short, geniculate at the base, springing between two short, triangular, acute, membranous auricles; pale narrow-linear, lodicules membranous, subspathulate with triangular, dentate apex; ovary densely hairy above.

Specimen $2\frac{1}{2}$ ft. high; lower cauline leaf 5 to 7 lines long, $\frac{1}{3}$ line in diameter. Panicle carried far above the leaves, 2 to $2\frac{1}{2}$ in. long, with 6 to 9 flower-heads, common pedicels 5 to 9 lines long, with clavate apex; outer glumes 5 lines; gl. III. $4\frac{1}{3}$ line long; callus hairs below gl. IV. half the length of the glume, which is scarcely $3\frac{1}{2}$ lines long, colourless below, becoming golden-yellow at the apex, the three parallel median nerves passing into the awn-base, the lateral pairs into the auricles, awn greenish-yellow, $\frac{1}{3}$ in. long; pale scarcely 3 lines.

A very distinct little species nearest to *T. inamoena* K. Schum., but distinguished by habit, congested panicle, glabrous pedicels, and shorter awns.

HUILLA.—Damp meadows at Lake Ivantâla; Feb. 1860. No. **7501**.

### TRIBE VIII. *ARUNDINEÆ*.

45. **TRICHOON** Roth in Roem. Arch. Botan. i. 3, p. 37 (1798). *Phragmites* Trin. Fund. Agrost. p. 134 (1820), pro parte; Benth. & Hook. f. Gen. Pl. iii. p. 1179.

1. **T. Phragmites.**

*Arundo Phragmites* L. Sp. Pl. 81 (1753). *Phragmites communis* Trin., *l.c.*; Steud. Syn. Pl. Gram. p. 195 (1854). *P. vulgaris* Crép. Man. Fl. Belg. ed. ii. p. 345 (1866); Durand & Schinz, Consp. Fl. Afr. v. p. 876.

AMBACA.—A grass 6 to 10 feet high, with the habit of *Arundo Donax*, densely cæspitose, glaucous green, with a woody tuberculed rhizome. Flowers were sought in vain. Very plentiful near streams. (Pamba, etc.) round Ngomba; in fl. Oct. 1856. No. **7318**.

PUNGO ANDONGO.—Muta Lucala; March 1857. No. **2802** (in part). In gravel on dried-up rivers. Cuanza; Nov. 1856. No. **2802***c*. The following numbers with immature spikelets should probably be included. A grass 8 to 15 ft. high, culms bristling below with spiny sheaths. Plentiful near the banks of the river Cuanza; Sansamanda, Feb. 1857. No. **2802** (in part). A very high grass, 20 ft. and more.

Marshes on Calemba Island; one specimen in flower. March 1857. No. **7397**.

Benguella.—A reed-like grass, 4 to 8 ft. high, with a rhizome creeping horizontally for 30 ft. or more, leaves spinescent or pungent, remarkably social. Very plentiful in rather damp sandy places by the banks of the river Cavado and Cotumbella; June 1859. No. **2287**.

Mossamedes.—Plentiful and forming dense reed-beds, in half dried-up thickets near the banks of the river Bero; by no means a friend to travellers. Sparsely flowering; July 1859. No. **2286**. Plentiful on the banks of the river Maiombo, between Pedra do Rei and Pedra de Sal; Oct. 1859. No. **2285**.

## Tribe IX. *CHLORIDEÆ*.

46. **MICROCHLOA** R. Br.; Benth. & Hook. f. Gen. Pl. iii. p. 1163.

1. **M. setacea** R. Br. Prodr. p. 208 (1810); Steud. Syn. Pl. Gram. p. 202 (1854); Durand & Schinz, Consp. Fl. Afr. v. p. 856.

*M. abyssinica* Hochst. ex A. Rich. Fl. Abyss. ii. p. 404 (1851); Steud., *l.c.*

Pungo Andongo.—Widely and densely cæspitose, with erect culms and very simple subfalcate spikes. On the spongy slopes of the more lofty rocks near Pungo Andongo; in fl. Nov. 1856. No. **2742**. Gravelly places in the præsidium; Jan. 1857. No. **2706**. Rocky places in the præsidium; Feb. 1857. Nos. **2799**, **2799***b*. Flowering somewhat rarely, in rock-fissures at Pedras Negras; April 1857. No. **2810**. Cæspitose, with culms and leaves coriaceous rigidulous suberect, spikes falcate greenish. On the banks of the great cataract of Condo but not plentiful; March 1857. No. **2807**.

Huilla.—In the damp pastures of Empalanca; April 1860. No. **2659**.

Var. **gracilis** Rendle var. nov.

A slender elongated variety $1\frac{3}{4}$ to 2 ft. high, with narrow weakly setaceous plicate or subflattened leaves 2 to $3\frac{1}{4}$ in. long, and gracefully curving spikes 6 to 8 in. long and scarcely exceeding $\frac{1}{2}$ line in width.

Pungo Andongo.—A very slender and elegant grass, 2 ft. high, somewhat cæspitose, a striking ornament of the somewhat damp wooded meadows near Mutôlo at Pedras de Guinga; March 1857. No. **2811**.

2. **M. ensifolia** Rendle sp. nov.

Perennial, densely cæspitose, the culms slender, ascending or erect, densely covered at the base with a growth of short, ascending, distichous, ensiform, blunt, stiffish, somewhat fleshy leaves with a strong prominent white scabridulous midrib and margins when young; cauline internodes 3, very slender, ultimately half as long again, or twice as long as the closely applied glabrous sheaths; nodes glabrous; ligule a very short membranous fimbriated ridge; blades generally very short; spike dense, secund, arcuate, spikelets $1\frac{1}{2}$ line long, lanceolate, acute, closely resembling those of *M. setacea*; barren glumes glabrous, 1-nerved, gl. I. elliptic-oblong, subacute, gl. II. oblong narrowing above to the shortly apiculate apex, green with hyaline white margins;

fertile glume hyaline, truncately ovate, plicate, shortly mucronate, nerves 3, hairy on the back, margins narrow, incurved at the lateral nerves; pale truncately lanceolate, apex retuse, nerves approximate, hairy on back; anthers 3, pale yellow; ovary glabrous.

Fully developed plants 8½ in. high, densely leaved, culm-bases 1¼ to 2 in. high, the sheaths short, compressed, and except the outermost hidden by those below, not exceeding 2 lines long; blades ½ to ¾ in. long, the older ones becoming flattened and 1⅔ line broad, cauline leaves linear, plicate, with shortly pungent apex, rarely exceeding ⅓ in long; fully grown flowering culms 7 in. above the leaves. Spikes reaching 2⅔ in., scarcely exceeding ½ line in width, rhachis glabrous. Spikelets whitish green in dried specimens; gl. I. 1½ line long, whitish with green nerve, gl. II. slightly longer (scarcely 1⅔ line) fertile gl. 1 line, pale slightly shorter, anthers a good ½ line.

The spike is that of *M. setacea*, but the species is distinguished by its broader ensiform leaves, which give it a very distinct habit.

Pungo Andongo.—A grass lasting several years, widely cæspitose like *Cherleria sedoides* in rock-fissures, leaves somewhat fleshy becoming pale on drying, spikes simple secund falcate. On the rocks of the præsidium, but not often flowering; Feb. 1857. Nos. **2800**, **2816**. Dec. 1856. No. **2763**.

3. **M. obtusiflora** Benth. in Hook. Niger Fl. p. 565 (1849); Steud., *l.c.*; Durand & Schinz, *l.c.*

Var. **minor** Rendle var. nov.

A small form 3½ to 5 in. high, with slender flexuose hair-like stem, basal leaves ½ to ¾ in. long, ¼ line or less in width; spike less than 1 in. long.

Huilla.—Humpata plateau, where Welwitsch was attacked by three lions; end of Jan. 1860. No. **2637**.

47. **CYNODON** Pers.; Benth. & Hook. f. Gen. Pl. iii. p. 1164.

1. **C. Dactylon** Pers. Syn. Pl. i. p. 85 (1805); Steud. Syn. Pl. Gram. p. 212 (1854); Durand & Schinz, Consp. Fl. Afr. v. p. 856.

*C. glabratus* Steud., *l.c.*; Durand & Schinz, *l.c.*, p. 857.

Island of St. Vincent, Cape Verde Is.—On short-grassed rather dry slopes of Monte Verde; Sept. 1853. No. **2924**.

Loanda.—Capim dos caballos (horse hay). Perennial, with very long stolons reaching 10 to 12 ft., rooting at the nodes. The most pleasing of the few grasses of the littoral region which are liked by cattle. Not plentiful enough on the low sunny sandy-clayey hills of the Loanda district near Alto das Cruzes on the way from Maianga do Povo; May 1858. No. **7305**. No. **7328** (no notes).

Bengo.—Among herbage in the palm-groves on the river Bengo; plentiful but only in places inundated in winter; Dec. 1853. No. **7453**.

Golungo Alto.—Called by the Portuguese colonists Capim de cavallos. A perennial strongly cæspitose grass, with tough stolons usually 5 to 8, sometimes 12 ft. long, spreading horizontally and rooting at the nodes, vegetating the whole year through. On poor rather dry hills throughout the district, but not universal. The only kind of

grass in the district which can be given without danger to horses. About Sange; in rather poor sunny localities Dec. 1854, No. **7183**; beginning of Aug. 1855, No. **2999**; Feb. 1855, No. **2993**; very plentiful on dry or rather dry slopes in the Sange district and almost the only fodder fit for horses, Nov. 1855, No. **7234**.

Pungo Andongo.—Nos. **2866, 2879** (no notes).

Mossamedes.—A perennial stoloniferous grass, stolons rooting. A terrible pest in plantations of cotton, etc. Too plentiful among crops of mandioca, cotton and maize near San João de Croque; 2 Sept. 1859. No. **2601**. Growing sparsely in fields between Mossamedes and Giraûl; July 1859. No. **2607**.

Var. **elegans** Rendle var. nov.

A graceful form with regular frequent culms, erect from an ascending base, densely clothed below with rigidulous, erect, slender, convolute, sparsely pubescent leaves; spikes 4 to 5, slender, suberect, deep purple.

Plants to 1 foot high; leaves 1 to 2 in.; spikes $1\frac{1}{2}$ to 2 in. long, by $\frac{1}{2}$ to $\frac{2}{3}$ line wide.

Mossamedes.—Colonial name Escalraz. A perennial very far creeping rigidulous grass, much liked by cattle. Leaves narrow, herbaceous green, erect and crowded, spikes 4, more rarely 5, dark purple. Sandy thickets between Cavalheiros and Boca (Garganta) do Rio Bero; 22 Aug. 1859. No. **2290**.

48. **CAMPULOSUS** Desv. in Nouv. Bull. Soc. Philom. ii. p. 189 (1810).

*Ctenium* Panz. in Denkschr. Acad. Münch. 1813, p. 288, t. 13 (1814); Benth. & Hook. f. Gen. Pl. iii. p. 1165.

1. **C. elegans** Gay ex Kunth Rev. Gram. p. 93 (1829) (*Campuloa*).

*Ctenium elegans* Kunth, *l.c.*; Steud. Syn. Pl. Gram. p. 202 (1854); Durand & Schinz, Consp. Fl. Afr. v. p. 859.

Pungo Andongo.—A very elegant widely cæspitose grass; culms erect 2 to 3 ft. or higher, spike elongated, simple, straight or generally falcate. Plentiful in rather damp meadows on the banks of the river Cuanza near Sansamanda, not seen elsewhere in Angola; end of April 1857. No. **2827**. In a few places near Candumba, but very plentiful between Sansamanda and Mopopo in damp meadows on the river Cuanza; beginning of May 1857. No. **2733**.

49. **ENTEROPOGON** Nees; Benth. & Hook. f. Gen. Pl. iii. p. 1165.

1. **E. melicoides** Nees in Lindl. Nat. Syst. ed. ii. p. 449 (1836).

*E. macrostachya* Munro ex Benth. in Journ. Linn. Soc. xix. p. 101 (1881); Durand & Schinz, Consp. Fl. Afr. v. p. 859. *Chloris macrostachya* Hochst. ex A. Rich. Fl. Abyss. ii. p. 409 (1851); Steud. Syn. Pl. Gram. p. 203 (1854).

Loanda.—Apparently lasting several years, widely cæspitose, culms and leaves erect, the latter scabrid, spike drawn out, moderately curved, purplish green. In thickets growing with a Capparid, etc., from Alto das Cruzes to Maianga do Povo; April and May 1854. No. **7446**. Somewhat plentiful on the drier grassy hills and cliffs to the south of Loanda between Alto das Cruzes and Maianga do Povo; in fl. Dec. 1858. No. **7314**.

50. **CHLORIS** Sw.; Benth. & Hook. f. Gen. Pl. iii. p. 1165.

1. **C. breviseta** Benth. in Hook. Niger Fl. p. 566 (1849); Steud. Syn. Pl. Gram. p. 207 (1854); Durand & Schinz, Consp. Fl. Afr. v. p. 860.

Golungo Alto.—Spikelets with a more or less golden-yellow sheen when alive. Plentiful in rather dry sunny places throughout the whole district. Sandy places near Cacarambola; Feb. 1855. No. **2983**. No. **2975** (no notes).

Pungo Andongo.—Sunny places at Sansamanda on the right of the river Cuanza; April 1857. No. **7386**.

2. **C. barbata** Sw. Fl. Ind. Occ. i. p. 200 (1797); Steud., *l.c.*, p. 204; Durand & Schinz, *l.c.*, p. 860.

Loanda.—Ponds near Boa Vista; March 1854. No. **7451**. Samba Grande; Feb. 1854. No. **7452**. 1853-4. No. **7377**. No. **7348***b* (no notes).

Mossamedes.—Sandy places on the thicket-grown banks of the river Bero. A single specimen almost past flowering. Aug. 1859. No. **2608**.

3. **C. radiata** Sw. Prodr. p. 26 (1788); Steud., *l.c.*, p. 205; Durand & Schinz, *l.c.*, p. 862.

*C. leptostachya* Hochst. ex A. Rich. Tent. Fl. Abyss. ii. p. 407 (1851); Steud., *l.c.*, p. 206; Durand & Schinz, *l.c.*, p. 861.

Golungo Alto.—A very elegant grass, with elongated linear spikes spreading stellately at the top of the culm, reddish or violet when alive. In lean grassy places near Sange; Dec. 1854. Nos. **2985**, **2985***b*. No. **7209** (no information).

Pungo Andongo.—An annual densely cæspitose grass, prostrate-ascending, glaucous-green, barbs of the spike bright violet. Plentiful in sunny places in the præsidium; end of Feb. 1857. No. **2801**. No. **2770** (no information).

4. **C. pubescens** Wawr. & Peyr. in Sitz. Ak. Wiss. Wien xxxviii p. 585 (1860), (Sert. Benguel. p. 45) non Lag.

Barra do Bengo.—Apparently perennial, widely cæspitose, primary culms erect, lateral decumbent, rooting, 2 to 6 ft. and longer, very viscid. Spikes yellow, anthers black. Plentiful on the sea-shore near Cacuaco and Barra do Bengo, (also in Praia de Zamba grande); June 1858. No. **7304**.

Loanda.—Plentiful on sandy hills near the Ocean between Cacuaco and Morro das Lagostas; Dec. 1853. No. **7454**. Boa Vista, Conceiçao; 10 Aug. 1854. No. **7455**. 1853-4. No. **7376**.

Mossamedes.—Rocky places by the sea and clayey thickets between Boa Vista and Giraûl; July 1859. No. **2902**.

5. **C. myriostachya** Hochst. in Flora xxxviii. p. 204 (1855); Durand & Schinz, *l.c.*, p. 862.

Loanda.—1853-4. Nos. **7337**, **7364**.

6. **C. subæquigluma** Rendle sp. nov.

Apparently perennial, spreading by slender woody runners; glabrous; culms erect from an ascending base, geniculate, simple or once branched; radical leaves distichously crowded, the outer becoming dry and membranous, sheaths compressed, membranous a little shorter than the short linear plicate rigidulous margined glaucous obliquely emarginate blades; ligule short, membranous;

cauline internodes 3 to 4, slender, wiry, exceeding the leaf-sheaths; leaves resembling the radical but with blades becoming shorter upwards; spikes 2 in. long, a digitate pair, spikelets dull purplish-brown, membranous, oblong-lanceolate, 2-flowered, for the genus rather laxly arranged on the slender purplish rhachis; barren glumes hyaline except the keel which is subscabridulous in the upper half, the outer narrowly oblong when flattened, acute, the inner ovate and slightly shorter with a bilobulate shortly aristate apex; fertile glume ovate, apex minutely bilobulate, with an interstitial awn about half the length of the glume, keel and especially the marginal nerves densely hairy; pale glabrous, lanceolate; upper glume shortly stalked, glabrous, hyaline, bluntly lanceolate, epaleate.

Plants in the type specimen 8 to 9 in. high, but reaching 1½ ft. in the set at Lisbon; leaf-sheaths about 1 in. or less in length, blades reaching 1½ in. long by nearly 2 lines broad, with a strong margin and conspicuous midrib. Spikelets the length of gl. I., which is a little over 2 lines long and nearly ⅔ line broad, gl. II. 2 lines long, about ¾ line broad, awn less than ¼ line; gl. III. barely 2 lines long not including the weak awn (½ to ⅔ line), pale slightly shorter, stamens 3, lodicules bluntly obcuneate, retuse; gl. IV. a little over 1 line long, stalk barely ¼ line.

A very distinct little species, recalling somewhat *C. monostachya* Poir. in habit, but a much more robust plant.

Pungo Andongo?—No. **2853** (no information).

51. **TRIPOGON** Roth; Benth. & Hook. f. Gen. Pl. iii. p. 1169.

1. **T. abyssinicus** Nees ex Steud. Syn. Pl. Gram. p. 301 (1854); Durand & Schinz, Consp. Fl. Afr. v. p. 864.

Pungo Andongo.—A densely cæspitose herb, scarcely a span high, culms and leaves rigidulous, often reddish; culms numerous, slender, sometimes oblique, sometimes straight, or even widely spreading. The habit simulating that of *Nardus strictus*. Plentiful in the clefts on the higher rocks of the præsidium but very sparsely flowering; in fl. and immature fr. 18 Dec. 1856. Nos. **2765, 2752**. Plentiful in damp lofty meadows of the præsidium at Funda-Quilombo; end of April 1857. No. **2813**. On the lofty rocks of Pedras de Guinga; Jan. 1857. No. **7389**.

52. **DINEBRA** Jacq.; Benth. & Hook. f. Gen. Pl. iii. p. 1171.

1. **D. arabica** Jacq. Fragm. p. 77, t. 121, fig. 1 (1800—1809).

*D. retroflexa* Panz. in Denkschr. Akad. Wiss. München. 1813, p. 270. t. 12 (1814); Steud. Syn. Pl. Gram. p. 299 (1854); Durand & Schinz, Consp. Fl. Afr. v. p. 865; var. *brevifolia* Durand & Schinz, *l.c.*; *D. brevifolia* Steud. *l.c.*

Loanda.—A laxly cæspitose rigidulous annual branched from the base, culms sometimes prostrate, sometimes ascending or obliquely erect, 1 to 3 in. to 1½ ft. long. Plentiful, but in a few localities, on plains flooded in the rainy season between Loanda and Quicuxe; 6 and 7 Feb. 1859. No. **2903**. Here and there in rather damp *Adansonia* groves near Imbondeiro dos Lobos; Feb. 1858. No. **7292**. Sporadic round drying-up ponds near Bemposta; June 1858. No. **7292*b***. Nos. **7338, 7483** (no information).

53. **DACTYLOCTENIUM** Willd. Enum. Pl. Hort. Berol. p. 1029 (1809).

*Eleusine* Gaertn., Benth. & Hook. f. Gen. Pl. iii. p. 1172, pro parte.

1. **D. ægyptiacum** Willd., *l.c.*; Steud. Syn. Pl. Gram. p. 212 (1854); Durand & Schinz, Consp. Fl. Afr. v. p. 868 (*ægyptium*).

Sierra Leone.—Sept. 1853. No. **2939**.

Ambriz.—Nov. 1853. Nos. **2899**, **2899***b*.

Loanda.—An annual cæspitose remarkably social grass, forming very elegant meadows everywhere in rather damp places; culms sometimes prostrate but generally erect or oblique, branched, spikes 1- to 7-digitate, greenish-yellow. Plentiful on grassy thicket-grown slopes between Conceiçao and Boa Vista; Jan. 1859. No. **2911**. Here and there in the Represa de Luiz Gomes; March 1854. No. **7308**. Nos **7329**, **7476** (no notes).

Pungo Andongo.—In meadows of the præsidium; Jan. 1857. No. **2705**. In meadows near Quilanga; May 1857. No. **2837**. No. **2846** (no notes).

Mossamedes.—1859. A fragment found with *Eragrostis variegata* Welw. (No. **2300**).

54. **ELEUSINE** Gaertn.; Benth. & Hook. f. Gen. Pl. iii. p. 1172, pro parte.

1. **E. indica** Gaertn. Fruct. p. 8 (1788); Steud. Syn. Pl. Gram. p. 211 (1854); Durand & Schinz, Consp. Fl. Afr. v. p. 866.

*E. textilis* Welw. in Murr. Journ. Trav. & Nat. Hist. i. p. 31 (1868), see also Apont. p. 541 (1859).

Madeira.—Thinly grassed places in the island and even in the public squares in Funchal; Aug. 1853. No. **2919**.

Sierra Leone.—Sept. 1853. No. **2940**.

Ambriz.—Nov. 1853. No. **2892**.

Icolo e Bengo.—Short-grassed pastures between Quifandongo and Funda, in clayey-sandy places flooded in summer: Dec. 1853. No. **7303**.

Loanda.—May and June 1858. No. **7339***b*. No. **7340** (no notes).

Golungo Alto.—The most plentiful grass in the district, known to the inhabitants as "pé de galinha," the most liked by cattle of all the grasses of the district; forms very green meadows everywhere in the rainy season. Rather damp pastures near Sange, Bango, etc.; Dec. 1854. No. **2988**. Plentiful in sunny grassy places through the whole district and very polymorphic. Between N-dele and Cacarambola; Feb. 1855. No. **2989**. No. **7221** (no notes).

Pungo Andongo.—Plentiful in mountain meadows near Caghuy. No. **2769**. Nos. **2841**, **2856** (no notes). An annual (?) grass 2 to 4 ft. high, culms green when alive, a very shining golden-straw colour when dried. Local name, Balayas. Coll. Carp. 1104.

Cultivated form.

E. coracana Gaertn., *l.c.*; Steud., *l.c.*; Durand & Schinz, *l.c.*

*E. coracana* var. Welw. in Murr., *l.c.*, p. 30. *E. Luco* Welw. Apont. p. 591.

Golungo Alto.—Native name Lúcu or Luco. An annual cultivated everywhere for making an African beer (Garapa) from the seeds. Grown at the river Luinha by Sr. Pereira; Sange, Jun. 1855. No. **2949**.

Pungo Andongo.—Indigenous in mountain meadows near Caghuy

and Pedras de Guinga. No. **2768**. Plentifully grown in the districts of Pungo Andongo, Songo, Condo, Quisonde, etc. ; also spontaneous. Negro name Luco, or Lúho. May 1857. Coll. Carp. 1103.

Huilla.—Luco. Cultivated by the natives (Munhaneca tribe). and spontaneous everywhere. Sr. Kneismann's garden ; beginning of May 1860. No. **2702**.

2. **E. verticillata** Roxb. Fl. Ind. i. p. 346 (1820); Steud., *l.c.*, p. 211 ; Durand & Schinz, *l.c.*, p. 867.

*Leptochloa Schimperiana* Hochst. in Flora xxxviii. p. 203 (1855), Durand & Schinz, *l.c.*, p. 869.

Loanda ?—Nos. **7339**, **7477** (no information)

55. **LEPTOCHLOA** Beauv.; Benth. & Hook. f. Gen. Pl. iii. p. 1172.

1. **L. uniflora** Hochst. ex A. Rich. Tent. Fl. Abyss. ii. p. 409 (1851); Steud. Syn. Pl. Gram. p. 209 (1854) ; Durand & Schinz, Consp. Fl. Afr. v. p. 869.

Cazengo.—Plentiful in very shady woods on both sides the river Luinha, growing in dense masses, and affording excellent fodder ; 25 Dec. 1854. No. **2981**. No. **2966** (no information).

2. **L. filiformis** Roem. & Schult. Syst. Veget. ii. p. 580 (1817); Steud., *l.c.*

Loanda.—1853-4. Nos. **7361**, **7361***b*, **7382**. Round drying-up ponds, and in rather damp abandoned fields, growing in thick masses, sometimes solitary ; July 1854. No. **7471**.

3. **L. chinensis** Nees Agrost. Bras. p. 432 (1829) ; Steud., *l.c.*

Pungo Andongo.—Caghuy ; Jan. 1857. No. **2704**.

Barra do Dande.—A cæspitose grass, 2 to 3½ ft., ascending ; flowers dark purple. Plentiful on the marshy banks of the river Dande near Bombo ; end of Sept. 1858. No. **7281**.

4. **L. obtusiflora** Hochst. in Flora xxxviii. p. 203 (1855).

*Eleusine obtusiflora* Schw. & Asch. Beitr. Fl. Æthiop. p. 299 (1867); Durand & Schinz, *l.c.*, p. 867.

Loanda.—An annual cæspitose erect grass. Sandy grassy places of Maianga d'El Rei ; May 1858. No. **7282**. 1853-4. Nos. **7353**, **7353***b* (no notes).

56. **LEPTOCARYDION** Hochst. ex. Benth. in Journ. Linn. Soc. xix. p. 110 (1881).

*Triodia* R. Br., Benth. & Hook. f. Gen. Pl. iii. p. 1175, pro parte.

1. **L. alopecuroides** Hochst. ms. in Schimp. Pl. Abyss. No. 2308.

*Triodia plumosa* Benth., *l.c.* ; Durand & Schinz, Consp. Fl. Afr. v. p. 877. *Leptochloa plumosa* Anderss. in Peters Reise Mossamb. p. 557 (1864). *Diplachne alopecuroides* Hochst. ex Schweinf. Beitr. Fl. Æthiop. p. 299 (1867). *Uralepis alopecuroides* Steud. Syn. Pl. Gram. p. 248 (1854).

Pungo Andongo.—A laxly cæspitose grass with a bromoid habit, culms ascending branched, spikes green-purplish, ultimately becoming

yellow, leaves glaucous. Sandy thickets between Luxillo and Cazella; middle of April 1857. No. **2825**. No. **2860** (no information).

Golungo Alto ?—Nos. **7265**, **7269** (no information).

57. **CROSSOTROPIS** Stapf in Fl. Capens. vii. p. 317 (1898). *Leptochloa* Beauv., Benth. & Hook. f. Gen. Pl. iii. p. 1172, pro parte.

1. **C. grandiglumis**.

*Leptochloa grandiglumis* Nees Fl. Afr. Austr. p. 252 (1841); Steud. Syn. Pl. Gram. p. 210 (1854). *Diplachne grandiglumis* Hack. in Engl. Jahrb. xi. p. 404 (1890); Durand & Schinz, Consp. Fl. Afr. v. p. 878.

Var. **minor** Rendle var. nov.

Spikelets smaller and more delicate than in the type, $2\frac{1}{2}$ to 3 lines long; flowering glumes subhyaline, more prominently awned than in the type, pale hyaline.

Pungo Andongo.—Quisonde, Condo; March 1857. No. **2709**.

Huilla.—A widely cæspitose grass. In thicket-grown pastures from Catumba towards O'Hay, in sandy sparsely herb-grown places; middle of May 1860. No. **7492**.

2. **C. eleusinoides** Rendle sp. nov.

Perennial (?), culms erect from a decumbent or ascending geniculate base; nodes glabrous, reddish-brown; internodes terete, rigid, glabrous, except the two upper short and covered by the loose dry submembranous striate tuberculately hairy sheaths; ligule colourless, subhyaline, subtruncate; blades rigid, shortly linear-tapering, apex pungent, becoming convolute, scabridulous on both faces, sparsely tuberculate-pilose on the lower; inflorescence a compound spike, linear-lanceolate to lanceolate, spikelets sessile, closely arranged in 2 rows on one side of the subflattened scabrid rhachis, forming ascending sessile spikes scattered on the scabrid-angled main axis; barren glumes subequal, 1-nerved, narrowly linear-lanceolate, acuminate, keel scabridulous, equal to or slightly exceeding the 4 to 5 flowers, the uppermost small and barren; fertile glumes ovate-oblong when flattened, hyaline, with a short weak awn about half the length from between the irregularly bilobed apex, margins pilose, incurved on the short lateral marginal nerves, back of glume sparsely pilosulose, pale slightly shorter, elliptical-oblong; fruit of the genus.

Culms to 15 in. high, lower internodes (2 to 4) $\frac{1}{2}$ to 1 in. long; leaves $1\frac{1}{2}$ in. long or less by $1\frac{1}{2}$ line broad. Panicle 4 or 5 in. long by $\frac{3}{4}$ in. across, becoming wider in the fruit from the greater spreading of the branches; branches shortening upwards, the lowermost $1\frac{1}{4}$ to $1\frac{3}{4}$ in. long. Spikelets 2 lines long, barren gl. greenish, with paler membranous margins, the lowest fertile gl. 1 line long excluding the awn, the upper becoming smaller; stamens 3, $\frac{1}{4}$ line long. Fruit compressed, rather deep brown, scarcely $\frac{3}{4}$ line long.

Near *C. arenaria* (*Leptochloa arenaria* Hochst.) but distinguished

by its regular compound spicate inflorescence, and smaller fewer-flowered spikelets, etc.

Loanda.—Quinta de Luiz Gomes; May 1854. No. **7460** (in part). No. **7482** (no notes).

Mossamedes.—1859. No. **2302***b*. A fragment of a stunted plant.

58. **DIPLACHNE** Beauv.; Benth. & Hook. f. Gen. Pl. iii. p. 1176.

1. **D. paucinervis** Stapf ined.

*Dactylis paucinervis* Nees Fl. Afr. Austr. p. 429 (1841); Steud. Syn. Pl. Gram. p. 297 (1854); Durand & Schinz, Consp. Fl. Afr. v. p. 904.

Mossamedes. — Perennial, stoloniferous, with ascending much branched purplish culms, rigidulous glaucous subviscid leaves, contracted spikes and the habit of *Poa* or *Danthonia*. Very plentiful and excluding almost every other plant at the subsaline ponds between Porto de Pinda and the mouth of the river Croque or Caroca; 31 Aug. 1859. No. **2613**.

59. **TRIRAPHIS** R. Br.; Benth. & Hook. f. Gen. Pl. iii. p. 1177.

1. **T. Pumilio** R. Br. in App. Denh. & Clapp. Trav. Afr. p. 245 (1826); Steud. Syn. Pl. Gram. p. 199 (1854).

*T. nana* Hack. in Engl. Bot. Jahrb. xi. p. 403 (1890); Durand & Schinz, Consp. Fl. Afr. v. p. 871. *Diplachne nana* Nees Fl. Afr. Austr. p. 259 (1841). *Trisetum nanum* Steud., *l.c.*, p. 227.

Mossamedes.—A somewhat cæspitose grass, fixed in rather damp sand by a few hair-like root-fibres. In sandy places on the river Bero (or Rio das Mortes) near Mata dos Carpinteiros; 1859. No. **2302**.

2. **T. Welwitschii** Rendle sp. nov.

A small annual; culms generally unbranched, cæspitose, with 3 to 4 internodes, exposed portion below the panicle sparsely pilose; leaf-sheaths striate, tuberculate-pilose, completely covering or slightly shorter than the internodes; ligule represented by a thin row of short hairs, sometimes obsolete; blade flat, linear, tapering to a subaristate apex, scabridulous and glabrous or sparsely tuberculate-pilose dorsally at the base; panicle somewhat lax, lateral branches short, spreading, ascending or suberect, solitary or fastigiate, spikelets terminal on the branchlets or shortly stalked, many-flowered, a deep wine-red, becoming brown; barren glumes slightly unequal or subequal, membranous, 1-nerved, glabrous, the lower often shorter, ovate, tapering to a shortly aristate apex, the upper narrowly oblong, the apex more or less tridentate with the median tooth shortly awned; flowering glumes slightly shorter than gl. II., with short slender shortly hairy callus, lanceolate to oval-lanceolate, 3-nerved, the median awn generally slightly exceeding the glume springing from between two short hyaline lobes, lateral awns about $\frac{1}{3}$ shorter, hyaline margins sparsely villous from above the base upwards; pale slightly shorter, narrow linear-oblong, glabrous, compressed.

Plants 6 to 11 in. high; the bases of the culms with their loose

sheaths and leaves reddish. Leaf-sheaths 1 to $1\frac{5}{4}$ in. long, or the lowermost shorter, the ascending or suberect blades except the shorter ones at the base of the culm, $1\frac{1}{2}$ to $3\frac{1}{2}$ in. long from scarcely 1 to 2 lines broad. Panicle half the height of the plant, more or less oblong tapering at the base; spikelets reaching $\frac{1}{2}$ in., but generally shorter, with 8 to 9 or fewer flowers; barren glumes about $1\frac{1}{2}$ line long, or the lower sometimes perceptibly shorter, $1\frac{1}{6}$ line; flowering glumes membranous with 3 strong nerves, the lowest $1\frac{1}{3}$ to $1\frac{1}{2}$ line long not including the awns.

Near *T. Elliotii* Rendle, but distinguished by its larger laxer panicle with smaller spikelets and glumes, and pilose habit.

Mossamedes.—Plentiful in sandy places by the river Bero near Cavalleiros; July and Aug. 1859. No. **2600**.

60. **CENTOTHECA** Desv.; Benth. & Hook. f. Gen. Pl. iii. p. 1190.

1. **C. lappacea** Desv. in Nouv. Bull. Soc. Philom. ii. p. 189 (1810); Benth. in Hook. Niger Fl. p. 56 (1849); Steud. Syn. Pl. Gram. p. 116 (1854).

Prince's Island.—In the more lofty woods of Pico de Papagaio; Sept. 1853. No. **2928**.

61. **ENTOPLOCAMIA** Stapf in Fl. Capens. vii. p. 318 (1898).

1. **E. benguellensis** Rendle sp. nov.

Apparently perennial and cæspitose, culms ascending, ultimately erect, geniculate, branching at the base; nodes dark, glabrous, cauline internodes 3 to 4, glabrous, terete, except the lowest exceeding the short loose membranous sheaths which are sparsely pilose at the mouth only; ligule a short row of hairs; blades rigidulous, subpatent, linear-tapering, acute, flat or incurved, glabrous except for a few hairs on the upper face at the base; inflorescence of a few spikelets sessile on the main rhachis, which in one case bears a lateral branch; spikelets ovate, densely many-flowered, distichous, compressed; glumes coriaceous, the lower 4 barren, 3- to 7-nerved, ovate-lanceolate to broadly ovate, increasing in size and strength upwards, strongly cuspidate, keels scabridulous, margin ciliate, especially near the base; fertile glumes broadly ovate, with a strong broad-margined ventricose base, and a subtruncate strongly cuspidate apex, strongly 7-nerved, 9-nerved below the apex, margins hyaline and ciliate especially near the base; pale hyaline, large, flat, narrow-lanceolate, blunt, the broad edges inflexed at the well-marked ciliate keels, a little shorter than the glume; anthers long, linear; styles long, plumose, projecting from between the cusps of the glumes.

Plants small, culms reaching 1 ft. high and $\frac{2}{3}$ line in diameter; leaf-sheaths $\frac{1}{2}$ to barely 1 in. long, blades scarcely exceeding 2 in. long by 2 lines in width at the base, jointed to and ultimately separating from the sheath. Inflorescence $1\frac{1}{2}$ in. long by scarcely $\frac{3}{4}$ in. broad; spikelets about $\frac{2}{3}$ in. long by $\frac{1}{3}$ broad, the majority contorted above the middle (probably from the attack of an insect).

Lowest barren gl. 3-nerved, 2 lines long, second 5-nerved, $2\frac{1}{2}$ line; the next pair intermediate in form between the former and the flowering glumes, 7-nerved, $2\frac{1}{2}$ lines long; fertile gls. 3 to $3\frac{1}{2}$ lines long, pale $2\frac{3}{4}$ to 3 lines; anthers 2 lines long.

Near *E. aristulata* (*Tetrachne aristulata* Hack. & Rendle, recently separated as a distinct genus by Dr. Stapf), but a far less robust plant with denser many-flowered spikelets and less rigid glumes.

Mossamedes.—On sandy rocky hills near Quipola in the Mossamedes district; June 1859. No. **2306**.

### Tribe x. *PAPPOPHOREÆ*.

62. **ENNEAPOGON** Desv. ex Beauv. Agrost. p. 81 (1812). *Pappophorum* Schreb., Benth. & Hook. f. Gen. Pl. iii. p. 1174, pro parte.

1. **E. abyssinicum.**

*Pappophorum abyssinicum* Hochst. in Flora xxxviii. p. 202 (1855); Durand & Schinz, Consp. Fl. Afr. v. p. 869.

Ambriz.—Nov. 1853. No. **2897**.

Loanda.—A cæspitose annual with plane flaccid leaves, ascending branched culms $1\frac{1}{2}$ to $2\frac{1}{2}$ ft. high, and panicled silky-shining spikes. In sandy plains between Penedo and Conceiçaõ; Jan. 1859. No. **2916**. Plentiful among stones on the roads right in the city of Loanda, growing with *Boerhaavia* and Amarantaceæ; Dec. 1858. No. **7293**. Palm groves on Loanda island, near Museque de Luiz Gomes, growing in dense masses and covering wide areas; April 1854. No. **7332**. Dry stony heights near Cacuaco; Dec. 1853. No. **7343** (in part). Among herbage in palm groves by the river and on the banks of the river Bengo near Porto Rei; Dec. 1853. Nos. **7332***b*, **7448**.

Mossamedes.—Growing in crevices of rocks on the mountains (apparently gneiss) near the mouth of the river Bero along with Pão d'Oleo (*Adina microcephala* Hiern); 22 Aug. 1859. No. **2291**. In coarse sand near the banks of the Bero from Quipola to Mata de Carpinteiros; July, Aug. 1859. No. **2304**.

The plants show considerable variation in the actual and relative size of the barren glumes, which have 3 main nerves, the outer being imperfectly 4- to 6-nerved. The colour of the dense panicle varies from a pale lucent straw-colour to cinereous, and the length from 1 to 8 in. The leaves are flat and narrow-linear, to $2\frac{1}{2}$ lines broad at the base, tapering to a long acuminate setiform apex, or narrower becoming more or less convolute and setaceous.

2. **E. pusillum** Rendle sp. nov.

A minute acaulescent annual forming small tussocks about 1 in. or less across, and $\frac{1}{2}$ to $\frac{3}{4}$ in. high, sparsely pubescent, leaves short, densely crowded, enveloping the small much reduced panicles; outermost sheaths broad, markedly striate; ligule a short row of hairs; blade convolute, setaceous, except in the outermost leaves exceeding the sheath; panicle few-flowered, spikelets shortly stalked; barren glumes membranous and hyaline except the green nerves, sparsely pilose, subcompressed, the outer elliptical-lanceolate, obtuse, sometimes minutely apiculate, incom-

pletely 5-nerved to about the middle, 1-nerved to the tip, the inner slightly longer, lanceolate, 3-nerved nearly to the tip, with two intermediate nerves to about the middle, apex irregularly obtuse; fertile glume cuneate-orbicular, densely ciliate on the back, setæ slender, plumose to below the middle, longer than the glume proper; pale bicarinate, keels and margin hairy in the upper two-thirds; gl. IV. short, truncate, with setæ longer in proportion, pale very short; gl. V. rudimentary.

Sheaths about $\frac{1}{4}$ in. long, blades $\frac{1}{2}$ in. Panicle $\frac{1}{2}$ in. or less, with 6 or fewer fertile spikelets. Gl. I. $1\frac{1}{2}$ to 2 lines long, gl. II. $1\frac{4}{5}$ to $2\frac{1}{6}$ line, gl. III. $2\frac{1}{4}$ to $2\frac{1}{2}$ lines, scarcely 1 line without the setæ, pale 1 line, gl. IV. 2 lines, less than $\frac{1}{2}$ line without the setæ.

A very distinct little plant, recalling in habit *E. brachystachyum* (Jaub. & Spach), but differing in the much reduced hidden panicle, lanceolate barren glumes, etc.

Mossamedes.—A dwarf grass growing in cushions, fixed by its capillary roots in the hardened sand (trap), subglaucous. Dry sand-hills by the Atlantic near Giraûl; July 1859. Nos. **2281**, **2883**.

3. **E. benguellense** Rendle sp. nov.

A small apparently annual tufted minutely pubescent plant, culms geniculate, much branched, spreading and ascending; lower leaf-sheaths short, broad, loose, the uppermost narrower, lowermost leaf-blades obsolete, upper narrowly linear, tapering, acute; ligule reduced to a short row of hairs; panicle small, very dense, ellipsoidal to ovoid, spikelets shortly stalked, greenish; barren glumes subequal, covering the fertile, membranous with conspicuous green nerves, compressed, elliptical when flattened, subobtuse, sparsely pilose, the lower 7- the upper 5-nerved; fertile gl. densely covered with short white hairs, shortly obcuneate from a truncate base when opened, teeth subulate, glabrous, rather longer than the blade; pale oblong, nerves ciliate; gl. IV. smaller, teeth more than twice the length of the glume, enclosing a ♂ flower, third floret represented by a small trifurcate rudiment.

Plants 3 to 8 in. high; leaf-sheaths conspicuously striate, especially the lower, $\frac{1}{2}$ to 1 in. long; leaves to $1\frac{3}{4}$ in. long by 1 line broad. Panicle $\frac{1}{2}$ to 1 in. long by $\frac{1}{4}$ to $\frac{1}{3}$ in. in diameter, spikelets $1\frac{3}{4}$ line long. Barren glumes 5- or 7-nerved to within a short distance of the 3-nerved apex, the lower $1\frac{3}{4}$ line long, the upper slightly shorter; gl. III. including the teeth barely $1\frac{1}{2}$ line long, gl. IV. 1 line.

A very distinct species.

Mossamedes.—Sandy places on the river Bero near Mata dos Carpinteiros; Aug. 1859. No. **2303**. Sandy places on the banks of the Bero and even in the river, near Quipola; past flowering. June 1860. No. **2304**.

63. **ANTOSCHMIDTIA** Steud. Syn. Pl. Gram. p. 199 (in note) (1854).

*Schmidtia* Steud. in Schmidt Fl. Cap. Verd. Ins. p. 144 (1852); Benth. & Hook. f. Gen. Pl. iii. p. 1175.

1. **A. pappophoroides** Boiss. Fl. Or. v. p. 559 (1884).

*A. quinqueseta* Boiss. *l.c.*; *Schmidtia pappophoroides* Steud. in Schmidt, *l.c.*, p. 145, Syn. Pl. Gram., *l.c.* Durand & Schinz, Consp. Fl. Afr. v. p. 871. *S. quinqueseta* Benth. ex Ficalho & Hiern in Trans. Linn. Soc. Ser. 2. ii. p. 31 (1881); Durand & Schinz, *l.c.*

Ambriz.—Nov. 1853. No. **2889.**

Loanda.—Dry stony heights near Cacuaco; Dec. 1853. No. **7343** (in part). 1853-4. Nos. **7358**, **7358***b*. Nos. **2909**, **7479** (no notes).

Mossamedes.—Plentiful in sandy soil on the river Bero at a league from the ocean; Aug. 1859. No. **2604.** In rather damp sandy soil on the river Caroca (now almost dried up) near Cabo Negro and the lakes; Sept. 1859. No. **2603.**

The specimens show considerable variation even in the same plant, in the size of the glumes, both barren and flowering, and the length of the setæ on the flowering glumes; also in the length and breadth of the leaves and the amount of hairiness. I cannot, however, find specific differences.

### Tribe XI. *ORYZEÆ.*

64. **ORYZA** L.; Benth. & Hook. f. Gen. Pl. iii. p. 1116.

1. **O. sativa** L. Sp. Pl. p. 333 (1753); Benth. in Hook. Niger Fl. p. 557 (1849); Steud. Syn. Pl. Gram. p. 3 (1854); Durand & Schinz, Consp. Fl. Afr. v. p. 788.

*O. punctata* Kotschy ex Steud., *l.c.*, p. 3.

Golungo Alto.—Cultivated on all sides in Sobato de Mussengue, and often found subspontaneous in places once cultivated. Caminho de Mussengue; Jan. 1856. No. **7220.**

Pungo Andongo.—In stagnant water or sluggish streams; culms 4 to 6 ft., erect or oblique, rhachis flexuose, awns very scabrid. In streams and large pools between Condo and Calemba Island on the right bank of the river Cuanza; March 1857. No. **7385.**

Welwitsch in Apont. p. 540 refers to the cultivation of rice in the "Regio Alto-plana," where extensive varzeas are devoted to its production. The following specimens occur in Coll. Carp. Inhambane rice of 1858, 1099; and Quilimane rice of 1860, 1100, rose-scented.

65. **HOMALOCENCHRUS** Mieg ex Hall. Stirp. Helv. ii. p. 201 (1768).

*Leersia* Sw. Prodr. p. 21 (1788); Benth. & Hook. f. Gen. Pl. iii. p. 1117.

1. **H. hexandrus** O. K. Rev. Gen. Pl. p. 777 (1891).

*Leersia hexandra* Sw., *l.c.*; Steud. Syn. Pl. Gram. p. 2 (1854); Durand & Schinz, Consp. Fl. Afr. v. p. 789.

Golungo Alto.—In marshy wooded places on the right bank of the river Cuango growing along with *Pycreus Mundtii* Nees and other Cyperaceæ; 8 Jan. 1855. No. **2996.**

Pungo Andongo.—A grass usually 5 to 8 ft., with graceful floating immersed culms, upper portion 1 to 1½ ft., immersed and flowering. In very deep ponds near the banks of the river Cuanza from Sansamanda as far as Condo, but rather rare; 30 April 1857. No. **2730.**

A lax but very widely cæspitose grass common in marshy wooded places between Condo and Quisonde ; March 1857. No. **2834**. A grass 3 ft. and higher, with graceful creeping culms, the flowering ones ascending. Grows sparingly in grassy swamps between Condo and Quisonde ; middle of March 1857. No. **7394**.

## Tribe XII. *ERAGROSTEÆ*.

66. **POGONARTHRIA** Stapf in Fl. Capens. vii. p. 316 (1898).

1. **P. falcata**.

*Leptochloa falcata* Hack. in Bull. Herb. Boiss. iii. p. 386 (1895).

Loanda.—Generally an annual, densely cæspitose, culms erect 1½ or 2 ft. high, spikes and spikelets remarkably stiff. Plentiful in sandy plains throughout the whole district. Museque de Luiz Gomes ; May 1858. No. **7287**. 1853-4. No. **7367**.

Barra do Bengo.—An annual erect widely cæspitose rigid grass. In thicket-grown sandy somewhat wooded places between Quicuxe and Cacuaco ; end of May 1858. No. **7287***b*.

Pungo Andongo.—Plentiful in sandy soil on the road-sides between Lombe and Quibinda, in dry and rather damp places ; March 1857. No. **7408**.

Huilla.—In sandy thickets on the edges of woods between Lopollo and Monino ; end of March 1860. No. **7487**.

67. **ERAGROSTIS** Beauv.; Benth. & Hook. f. Gen. Pl. iii. p. 1186.

Sect. 1.—Cataclastos.

1. **E. aspera** Nees Fl. Afr. Austr. p. 408 (1841) ; Steud. Syn. Pl. Gram. p. 272 (1854) ; Durand & Schinz, Consp. Fl. Afr. v. p. 879.

Golungo Alto.—A very elegant erect grass, 1 to 2½ ft. high, with tremulous spikelets sometimes green sometimes a beautiful violet colour. In rich soil interspersed with sand in places once cultivated by the banks of the river Cuango near Sange ; June and beginning of July 1855. No. **7245**.

Pungo Andongo ?—Nos. **2857***b*, **2862** (no information).

Huilla.—Plentiful in fields after cultivation of maize and *Sorghum*, in the Lopollo district ; April 1860. No. **7494**.

2. **E. ciliaris** Link Hort. Berol. i. p. 192 (1827) ; Benth. in Hook. Niger Fl. p. 567 (1849) ; Steud., *l.c.*, p. 265 ; Durand & Schinz, *l.c.*, p. 881.

Loanda.—Quinta de Luiz Gomes ; May 1854. No. **7460** (in part). Nos. **7461-3**, **7465** (no notes). Near S. Pedro and on the way thence to Maianga do Povo ; beginning and middle of Jan. 1858. No. **7466**. 1853-4. Nos. **7373** (in part), **7374**.

Golungo Alto.—No. **7260** (no notes).

Pungo Andongo.—Candumba ; Jan. 1857. No. **2703**.

3. **E. caniflora** Rendle sp. nov.

Annual, cæspitose, culms and leaf-shoots surrounded at the base by membranous withering leaf-sheaths, culms a foot or less in height enveloped to within a short distance of the panicle by the sheaths which are subcompressed, stramineous, glabrous ; ligule a

membranous line; blade flat, narrowly linear-lanceolate, acuminate, pilose on both faces, suberect; panicle small, dense, oblong, nodes pilose, branches ascendo-patent, branched from the base upwards; spikelets dark purple, small, 3-flowered, covered with white hairs, subcompressed, ovate, pedicels generally longer than the spikelet, slender, purplish, glandular a little below the spikelet; rhachis jointed below each flower; barren glumes large, reaching above the middle of the spikelet, subequal, lanceolate, acute, 1-nerved; fertile glumes membranous, elliptical, apex truncate, broken and ciliate, lateral nerves complete; pale slightly shorter, the inflexed margins and upper portion of back ciliate, keels well-marked, minutely scabridulous in the upper half, back elliptical when flattened, apex truncate and densely ciliate; stamens 3.

The plants, all of which are young, are 1 ft. or less in height, with the internodes (7 in number) covered with the overlapping sheaths; the leaf-blades reach 3 in. in length by barely 2 lines in width. Panicle 2 in. long by $\frac{3}{5}$ in. in diameter, branches $\frac{3}{4}$ in. or less; spikelets scarcely exceeding 1 line in length, slightly less in breadth. Barren glumes about 1 line long, fertile glumes scarcely 1 line, anthers a good $\frac{1}{3}$ line.

Near *E. hispida* K. Schum., which however differs in its longer narrower leaves, more diffuse dull green panicle with larger spikelets, and the long-ciliate scabrid keels of the pales.

HUILLA.—Wet pastures by the river Monino; April 1860. No. **2698**.

4. **E. annulata** Rendle in Journ. Bot. 1891, p. 72.

Var. **major** Rendle var. nov.

Differs from the type in its broader oblong-lanceolate to ovate spikelets, which are also generally more shortly stalked and only occasionally show the characteristic annular gland. Spikelets 2 to 4 lines long by about $1\frac{1}{4}$ line broad.

MOSSAMEDES.—In sandy places on the banks of the river Bero, near Cavalheiros; July and Aug. 1859. No. **2298**.

5. **E. tenella** Beauv. ex Roem. & Schult. Syst. ii. p. 576 (1817).

Var. **viscosa** Stapf in Fl. Brit. Ind. vii. p. 315 (1896).

*E. viscosa* Trin. in Mém. Acad. Imp. Sci. Petersb. Ser. 6. i. p. 397 (1830); Steud., *l.c.*, p. 265; Durand & Schinz, *l.c.*, p. 891. *E. retinorrhœa* Steud., *l.c.*, p. 268.

PUNGO ANDONGO.—A beautiful grass, annual, erect, sparsely branched, spikelets purplish. Here and there in sandy thickets between Bumba and Condo; March 1857. No. **7415**. No. **2877** (no notes).

HUILLA.—In places once cultivated and in fields behind maize plantations near Lopollo; May 1860. No. **2697**.

Var. **compacta** Stapf ined.

LOANDA.—No. **7478**. A monstrous form.

HUILLA.—Plentiful in fields where *Zea Mays* is cultivated, near Lopollo and Nene; May 1860. No. **2635**.

6. **E. interrupta** Beauv. Agrost. p. 162 (1812).

Var. **namaquensis** Durand & Schinz, *l.c.*, p. 884.

*E. namaquensis* Nees ex Schrad. in Linnæa xii. p. 452 (1838),

Fl. Afr. Austr. p. 408 (1841); Steud., *l.c.*, p. 272. *Catabrosa micrantha* Hochst. ex A. Rich. Tent. Fl. Abyss. ii. p. 426 (1851). *Poa sporoboloides* A. Rich., *l.c.*

Ambaca.—In damp sandy places between Ambaca and Zamba; 17 Oct. 1856. No. **2745**.

Loanda.—Very plentiful by dried-up ponds near Quicûxe (Represas pequenas do Sr. Ricardo) and hitherto only found in that place; July 1854. No. **7291**.

Golungo Alto ?—No. **2970** (no information).

Huilla.—By the stream (now almost dried up) of Mumpulla, but growing very sparsely; Oct. 1859. No. **2658**.

Mossamedes.—In sandy places on the river Maiombo, growing with a species of *Arundo*, culm erect, 3 to 5 ft. high; Oct. 1859. No. **2305**. A rigidulous grass with chestnut-coloured spikes and culms somewhat branched at the base. Rather rare in damp sandy places on the river Bero (named Bocca [mouth] or Garganta do Rio Bero), July 1859; and in swampy places on the river Caroca, Sept. 1859. No. **2599**. An annual *Aira*-like grass rather rare about the lakes near S. Joie de Caroca, Cabo Negro; Sept. 1859. Coll. Carp. 1105.

Sect. 2.—Pteroessa.

7. **E. amabilis** Wight & Arn. ex Nees in Hook. & Arn. Bot. Beech. Voy. p. 251 (1841); Steud., *l.c.*, p. 265.

*E. unioloides* Nees ex Steud., *l.c.*, p. 264; Durand & Schinz, *l.c.*, p. 891.

Pungo Andongo.—An annual about a span high, laxly cæspitose, slender, elegant; culms filiform, ascending, spikelets somewhat flattened; whitish, *Briza*-like. On the rocky sandy-clayey slopes of Pedras de Guinga, with species of *Gladiolus*; March 1857. No. **2936**. By sides of streams between Candumba and Muta Lucala but rare; March 1857. No. **2936***b*.

8. **E. stenophylla** Hochst. ex Miq. Analect. Bot. Ind. ii. p. 27 (1851); Steud., *l.c.*, p. 266 (1854).

Sierra Leone.—Sept. 1853. No. **2945**.

Pungo Andongo.—Plentiful in marshy sandy meadows between Candumba and Lombe; March 1857. No. **2814**. Nos. **2861**, **2873** (no notes).

9. **E. Welwitschii** Rendle sp. nov.

A delicate cæspitose annual; culms filiform, erect, branched, internodes 4 to 5, polished, glabrous, the lower short; nodes slender, brown, glabrous; leaves small, lower sheaths papery, compressed, carinulate exceeding the internode, the upper becoming cylindrical and increasingly shorter than the internode, glabrous except for a few hairs at the constricted mouth; ligule a dense row of minute hairs; blade narrow, tapering gradually from the base to the sharply acute apex, convolute, upper face sparsely pilose, lower and outer glabrous, striate, with prominent midrib; panicle oblong, glabrous, branches solitary, short, capilliform, ascendo-patent, bearing from the base upward similar branchlets or stalked subpatent spikelets, pedicels about as long as, or of the terminal, longer than the spikelets, the latter oblong to oblong-lanceolate, compressed, compact, purplish, 10- to 14-flowered; barren glumes

reaching to within $\frac{1}{3}$ of the top of the lowest fertile glume, lanceolate, acute, keels scabridulous, the lower slightly shorter; fertile glume elliptical-ovate, acute, 3-nerved, purplish-green, glabrous; pale persistent perceptibly shorter, keels strong, ciliolate; grain reddish-brown, globose, smooth, with darker small subbasilar hilum.

Plants 14 to 15 in. high; internodes $\frac{1}{4}$ to $\frac{1}{3}$ line thick, $\frac{1}{2}$ to $2\frac{1}{2}$ in. long, not including the elongated flowering one which with the panicle may reach 10 in. long. Leaf-sheaths from a little over $\frac{1}{2}$ to $1\frac{1}{2}$ in.; blade 1 to $1\frac{3}{4}$ in. long, barely reaching 1 line in width at the base when flattened. Panicle $2\frac{1}{2}$ to 4 in. long by $\frac{1}{2}$ to $\frac{3}{4}$ in. in diameter, lower branches $\frac{3}{4}$ to $1\frac{1}{4}$ in. long, becoming shorter upwards; spikelets 2 to $2\frac{1}{2}$ lines long by 1 line or nearly 1 line broad; lower barren gl. $\frac{1}{2}$ to $\frac{3}{5}$ line, upper $\frac{2}{3}$ to $\frac{3}{4}$ line; fertile gl. $\frac{2}{3}$ line; anthers withered, $\frac{1}{4}$ (?) line long; grain $\frac{1}{5}$ line.

Near *E. stenophylla* Hochst. but a more delicate plant, distinguished by its smaller oblong panicles, more compressed spikelets, and acute glumes.

Pungo Andongo ?—No. **2961** (no information).

10. **E. procerior** Rendle sp. nov.

Perennial, sparsely cæspitose, culms tall, erect from an oblique base, simple or branched, internodes 4, strong, subterete, glabrous, the lowest short, and enveloped by the dry sheaths, the upper successively longer and exceeding the sheaths; nodes conspicuous, glabrous; sheaths at base of culm and on leaf-shoots scabridulously pilose, especially at the mouth, cauline sheaths glabrous except for a few hairs at the mouth; ligule a very short densely hairy ridge; blade rigidulous, convolute, narrowly linear, tapering to a setiform apex, scabridulously pilose, especially when young; panicle large, ellipsoidal, diffuse, much branched, branches more or less aggregated in the lower part but not verticillate, becoming irregularly scattered above, slender, flexuosely spreading, branched from the base; spikelets on pedicels which in the terminal may exceed, but in the lateral are generally shorter than the spikelet, the latter broadly linear to linear-lanceolate, fuscous-green, 6- to 14-flowered; barren glumes large, subhyaline, reaching within about $\frac{1}{3}$ of the tip of the lowest fertile glume, keels minutely scabridulous, the lower smaller by about $\frac{1}{2}$, oblong-lanceolate, blunt, the upper ovate, blunt to subacute; fertile glumes broadly elliptic-ovate, blunt, pale scarcely shorter, keels not strong, minutely scabridulous above the middle, obovate when flat with truncate apex; grain smooth, subcompressed, ellipsoidal, shallowly excavated at the hilum, with a broad median dorsal furrow, brown, hilum dark brown.

Plants 3 to 6 ft. high; root-fibres thick, densely hairy; lowest internode of culm $1\frac{1}{2}$ to $1\frac{3}{4}$ in. long, by about 1 line wide; leaf-blades on the leafy shoots reaching 1 ft. in length, $\frac{1}{2}$ line or less in diameter in their natural convolute state, those of the flowering culm shorter. Panicle 1 ft. long by 5 to $7\frac{1}{2}$ in. in diameter, branches scabridulous, $4\frac{1}{2}$ in. long and less; branchlets an

pedicels filiform, scabridulous; spikelets 3 to 5 lines by about 1 line greatest width. Barren glumes $\frac{3}{4}$ to 1 line and 1 to $1\frac{1}{6}$ line respectively; fertile glumes about 1 line long by $\frac{2}{3}$ to $\frac{2}{3}$ broad; anthers barely $\frac{3}{4}$ line; grain barely $\frac{3}{5}$ line.

Near *E. tenuifolia* Hochst. but distinguished by the much larger barren glumes, broader flowering glumes and weaker broader pales.

Huilla.—Rather rare; by stream-cataracts in the rocky parts of Humpata, and in gravelly-sandy places at the cataract of the stream from Morro de Lopollo on the way to Humpata; beginning of Dec. 1859. No. **2655**. Damp meadows between Lopollo and Nene; Feb. and April 1860. No. **2654**.

11. **E. elongata** Jacq. Ecl. Gram. Rar. p. 3 t. 3, (1813); Steud., *l.c.*, p. 264.

*E. Brownei* Nees ex Steud. Nom. ed. ii. ii. p. 562 (1840); Steud., *l.c.*, p. 279; Durand & Schinz, *l.c.*, p. 881. *Poa polymorpha* R. Br. Prodr. p. 180 (1810).

Pungo Andongo.—A grass with a *Poa*- or *Festuca*-like habit, cæspitose, culms 3 to 6 ft. erect, leafy, panicle nodding. Plentiful at the rocks and in wet places near the great cataract of the river Cuanza behind Condo; 17 March 1857. Nos. **2724**, **7433**.

Huilla.—Sparsely grassed thickets near Nene; Oct. 1859. No. **7521**.

12. **E. andongensis** Welw. ms. in herb.

Perennial with a strong woody rhizome, culms strict, densely cæspitose, closely sheathed for a third of the distance from the base by the long chartaceous subterete sheaths, sheaths striate, sparsely pilose when young, ultimately glabrous except at the mouth; ligule a short membranous ridge; blade suberect, rigidulous, very long, narrow-linear, acuminate, becoming convolute with subpungent apex, densely pilose on the upper face when young, becoming less pilose when convolute; inflorescence narrow cylindrical, interrupted, rhachis elongated, strong, scabrid, twisted, bearing numerous short, sessile, congested spikes; spikelets 12- to 18-flowered, compressed, linear-oblong to oblong-lanceolate, compact, olive-green, solitary or in pairs in the upper part of the inflorescence; barren glumes brown, 1-nerved, the lower lanceolate to ovate, acute, the upper about $\frac{1}{4}$ longer, subacute, keels scabridulous, reaching $\frac{1}{2}$ to $\frac{2}{3}$ up the back of the lowest fertile glumes; fertile glumes ovate, cuspidate, lateral nerves ceasing about $\frac{1}{3}$ from the apex, keels becoming stronger and minutely scabridulous above the middle and prolonged above into the short cusp; pale scarcely shorter, angularly curved, blunt, large, broadly elliptical when flattened, keels broad and scabridulous, inflexed margins broad.

Flowering culm (including inflorescence) 27 in. long, internodes four, $\frac{1}{2}$, 1, 3, 15 (to the base of the inflorescence) in. respectively. Leaves as long as the culm, $\frac{1}{2}$ line across. The specimen includes a young subspreading leaf-shoot about 15 in. high, the leaves of which are mostly flattened from a plicate base, $4\frac{1}{2}$ to 12 in. in length by barely 1 line maximum breadth, the sheaths are

narrow, and 2 in. or less in length. Inflorescence $7\frac{1}{2}$ in. long, $\frac{1}{2}$ in. or less in length, containing 3 to 5 spikelets 3 to $5\frac{1}{2}$ lines long by $1\frac{1}{8}$ to $1\frac{1}{2}$ broad; barren glumes 1 and $1\frac{1}{4}$ line respectively; fertile glumes scarcely $1\frac{1}{2}$ line long by $\frac{3}{4}$ line broad, pale $1\frac{1}{3}$ line by $\frac{3}{5}$ broad when flattened; anthers barely $\frac{2}{3}$ line.

Near some of the larger spikeleted forms of *E. elongata* Jacq., but distinguished by its cuspidate flowering glumes, and especially the large broadly elliptical pale with broad keels and broad inflexed margins. It also resembles, especially in the habit of the inflorescence, the Abyssinian *E. longifolia* Hochst., but is a much larger plant; the pale of *E. longifolia* moreover is larger, with the keels falling conspicuously short of the scarious apex. The Brazilian *E. rufescens* Nees differs in habit and in its much smaller pale.

Huilla.—Plentiful on the highest ridges of the loftiest rocks of the præsidium; Dec. 1856. No. **2755**.

13. **E. major** Host Gram. Austr. iv. p. 14, t. 24 (1809).

*E. megastachya* Link Hort. Berol. i. p. 187 (1827). *E. pœoides* Trin. in Mém. Acad. Petersb. Ser. 6. i. p. 404 (1830); Steud., *l.c.*, p. 263. *E. multiflora* Asch. in Schweinf. Beitr. Fl. Æthiop. pp. 299 and 310; Durand & Schinz, *l.c.*, p. 885.

Loanda.—An annual with sparsely cæspitose ascending culms 1 to 2 ft. high; spikelets greenish-white. Plentiful in sandy herb-grown places between Maianga do Povo and Imbondeiro dos Lobos, April 1854 and beginning of June 1858. No. **7316**. On small hills above Loanda, sporadic on the sandy banks of the river; very polymorphic; beginning of Dec. 1857. No. **7333**.

Golungo Alto.—A polymorphic species, probably described by different authors under different names. In rather dry sunny places and among cultivated herbs near Sange and Trombeta; Dec. 1854. No. **7177**. In dry poor soil near Camilongo; July 1855. No. **7272**. No. **7253** (no notes).

Pungo Andongo.—No. **2875** (no notes).

Huilla.—In thicket-grown sandy pastures at Lake Ivantâla; Feb. 1860. No. **2647**. On low hills by streams near Humpata; May 1860. No. **7522**.

Mossamedes.—In rather damp sandy places in the almost dry bed of the river Bero or Rio das Mortes near Mata do Carpinteiros, but only here and there; 22 Aug. 1859. No. **2299**.

14. **E. Hierniana** Rendle sp. nov.

Perennial by a strong slender rhizome, cæspitose, culms simple or branched, tall, stout, stramineous, with 5 terete glabrous internodes, nodes glabrous; leaf-sheaths, except the lowest and highest, about half the length of the internode, loose, glabrous; ligule a very short row of hairs; blade erect, rigidulous, glabrous, linear-tapering from a broader base, more or less convolute, acute; panicle large, much branched, diffuse, broadly obovoid, glabrous, branches alternate, the lower distant and spreading at about 45°, the upper less regular, branchlets filiform; spikelets long- or short-stalked, compressed, large, many-flowered, linear-

oblong to narrow-lanceolate, greenish-brown; fertile glumes rigid, subacute, lateral nerves very strong, keel inconspicuously scabridulous below the apex, ovate-lanceolate when flattened; pale persistent, slightly shorter, keels strong, scabrid and long-ciliate, back narrowly elliptical, apex truncate; grain narrow, more than 3 times as long as broad, tapering above the basilateral hilum to the blunt apex, reddish-brown, smooth.

Plants about 4 ft. high, internodes (excepting the flowering) from $\frac{3}{4}$ in. to 1 ft., and $2\frac{1}{4}$ to $8\frac{1}{2}$ in. respectively on the two culms present, lowest internode $1\frac{1}{4}$ line in diameter; leaf-sheaths 3 to 5 in., blades to 10 in. long, with a breadth at the base exceeding 2 lines. Panicle reaching a foot in length by nearly 9 in. across; lower branches 6 in. long; spikelets $\frac{1}{2}$ to $\frac{3}{4}$ in. long by $1\frac{1}{2}$ to nearly 2 lines across; pedicels 1 to 6 lines long; barren glumes fallen; fertile glumes $1\frac{2}{3}$ line long; anthers a good $\frac{1}{2}$ line; grain $\frac{2}{3}$ line.

Resembles *E. tremula* Hochst. in habit, but is a very distinct species characterised by the broader spikelets, subacute glumes, and large narrow grain.

Pungo Andongo.—In rather damp places in the præsidium; Feb. 1857. No. **2798**.

The dedication of this fine species to Mr. Hiern needs no explanation.

15. **E. passa** Rendle sp. nov.

Apparently perennial with a slender creeping rhizome; culms cæspitose, branched, weak, slender, internodes 3 to 4, subterete, polished, except the uppermost which bears the inflorescence not elongated; nodes brown, glabrous; lower sheaths exceeding or subequal to the internodes, weak, loose, membranous, subcompressed, glabrous except for a few hairs at the mouth; ligule short, densely hairy; leaves weak, flat, linear, tapering both to the base and the fine acute apex, glabrous, scabridulous, veins 3 to 5, subprominent below; panicle large, especially for the size of the plant, ovoid, effuse, distant-flowered, glabrous, branches filiform, opposite or scattered, ultimately widely spreading, often horizontally, bearing at about equal distances from the base upwards capillary widely spreading branchlets which in the lower part of the panicle may branch again, but otherwise bear directly the long-stalked spikelets; the latter pale green, subcompressed, lanceolate to oblong-lanceolate, 4- to 6-flowered, barren glumes subhyaline, acute, 1-nerved, carinulate and scabridulous in the upper two-thirds, reaching about half-way up the next fertile glumes, the lower lanceolate, somewhat shorter than the upper which is ovate; fertile glume shortly ovate, blunt, 3-nerved, lateral nerves submarginal and curved, falling short of the apex; pale persistent, scarcely shorter, included, upper third of keels obscurely ciliolate; anthers pale brown, short; grain red, rugulose, subrhomboidal tapering slightly towards the base, hilum occupying about half the ventral face, the back rounded and with a well-marked longitudinal median groove.

A delicate graceful plant 2 ft. high, internodes (except the flowering) $\frac{3}{4}$ to $2\frac{1}{2}$ in. long, less than $\frac{1}{2}$ line in diameter; cauline leaves scarcely reaching 6 in. long, greatest breadth a short distance from the base $1\frac{1}{2}$ line. Panicle 10 to 12 in. long, rhachis slender, curving, branches near the base of the largest reaching 4 in. long, becoming gradually shorter upwards, branches and branchlets widely curving, pulvinate; spikelets 2 lines or slightly less in length, reaching barely a line in breadth above the base, pedicels 3 to many times their length. Lower barren glume $\frac{1}{2}$ to $\frac{3}{5}$ line long, upper $\frac{2}{3}$ line; fertile glume $\frac{3}{4}$ line long; anthers $\frac{1}{4}$ line, grain $\frac{1}{3}$ line.

Is near *E. patentissima* Hack. (e descript.), which however has larger spikelets and much larger ovate-lanceolate acuminate flowering glumes.

Huilla.—Rather damp abandoned fields near Lopollo; April 1860. No. **2656**.

16. **E. platyphylla** Rendle sp. nov.

An elegant sparsely cæspitose annual; culms tall, erect, compressed, nodes brown, glabrous, the lowest geniculate, internodes 4, glabrous, with an annular patch of glands below the node, the 2 lower much the shorter; sheath thinly membranous when dry, glabrous, striate, the lowest exceeding its internode, the upper increasingly shorter than the internode; ligule a short dense line of hairs; blade weak, glabrous, elongated, very narrowly linear-lanceolate, or linear tapering gradually to the setiform apex and more abruptly at the base, veins 7 to 9, white, subprominent below; panicle gracefully curving, pyramidal, branches in a whorl of 4 at the lower node, which alone is sparsely pilose, whorled and alternate above, gracefully spreading below, ascending to suberect above, bearing short lateral subappressed branches except for a short distance at the base; spikelets except the terminal shortly stalked, lanceolate to oblong-lanceolate, 6- to 8-flowered, a dull olive-green; barren glumes unequal, hyaline, reaching above the middle of the next flowering glumes, lanceolate, blunt or subacute, carinulate and scabridulous above the base; fertile glumes glabrous, ovate, blunt, imperfectly 3-nerved, lateral nerves scarcely reaching the middle; pale about $\frac{3}{4}$ the length of the glume, curved, apex broadly truncate, broken, keels well-marked, glabrous; grain red, ellipsoidal, asymmetrical at the hilum, laterally compressed, with a wide median dorsal groove.

A graceful plant 3 ft. high; leaf-sheaths 2 to $5\frac{1}{2}$ in. long; leaves reaching nearly 1 ft. in length by 2 lines greatest width. Panicle 6 to 10 in. long by $3\frac{1}{2}$ to 5 in. across, lowest branches 3 in. long, branchlets $\frac{3}{4}$ in. or less; spikelets 2 to $2\frac{1}{4}$ lines by $\frac{2}{3}$ to $\frac{4}{5}$ line, pedicels 1 line or less; barren glumes $\frac{1}{2}$ and $\frac{5}{6}$ line respectively; fertile glume $\frac{3}{4}$ line, pale $\frac{2}{3}$ line; anthers pale brown, barely $\frac{1}{2}$ line; grain barely $\frac{1}{2}$ line.

Recalls *E. passa* in characters of foliage and spikelet, but is

distinguished by its less diffuse panicle, with short branchlets and short-stalked spikelets, also by its glabrous ellipsoidal grain.

Pungo Andongo ?—No. **2862***b* (no information).

17. **E. agrostoidea** Rendle sp. nov.

Annual, culms erect from an ascending base or spreading and often branching profusely at the strong geniculate nodes, internodes terete, polished, with a glandular ring just below the brown internode; leaf-sheaths terete, or subcompressed and often subcarinate, except the lowermost shorter than the internodes, more or less glandular-punctate, conspicuously hairy at the mouth; ligule a short dense row of hairs; blades rigidulous, spreading, linear-tapering, acute, more or less convolute, scabridulous, sometimes sparsely hairy below, base of midrib with a row of glands; panicle oblong or ellipsoidal to pyramidal, glabrous, branches spreading or ascending, whorled and scattered, slender, subrigidulous, bearing branchlets or spikelets almost from the base; spikelets a dull olive-green, generally shortly stalked, soft, subcompressed, compact, linear, generally 6- to 8-flowered; barren glumes thinly membranous, subequal, inconspicuously 1-nerved, lanceolate to ovate, generally acute, reaching about to the tip of the two lowest fertile glumes, the midrib dorsally subscabridulous in the upper portion, the upper broader than the lower, and often less acute; fertile glumes glabrous, with rounded back, broadly elliptical to orbicular-ovate, apex rounded or blunt, 3-nerved, the outer nerves submarginal and curved, falling short of the apex; pale persisting after fall of the glume, weakly bicarinate, keels scarcely scabridulous in the upper part; grain shortly ellipsoidal, pale transparent brown with a darker hilum.

Plants 8 to 18 in. high, of slender graceful habit, culms more or less rigid with 3 to 4 internodes. Leaf-sheaths generally between 1 and 3 in. long, ligule $\frac{1}{4}$ line long, leaves 1 to 4 in. Panicle from less than 3 to 6 in. long, generally between 1 and 2 in. broad, sometimes broader at the base; spikelets about 2 lines long or less; barren glumes $\frac{2}{3}$ to nearly 1 line long, fertile glumes $\frac{2}{3}$ to $\frac{3}{4}$ line long, pale slightly shorter; anthers brown, $\frac{2}{3}$ line long; grain $\frac{1}{4}$ line.

Recalls *E. pilosa* Beauv., but has a stiffer habit, larger subequal barren glumes, etc. Apparently nearest *E. porosa* Nees, but distinguished by its dark-coloured, more compact spikelets, and subequal barren glumes.

Ambaca.—A slender grass with the habit of *Agrostis*, 1 ft. or 1½ ft. high; culms branched. Fields near Ambaca, No. **2746**; mandioca plantations near Ngombe (Residencia do Distos) but better specimens vainly sought for, No. **7319**; Oct. 1856.

Loanda.—An annual; somewhat plentiful round ponds and in their clayey bottom when dried up not far from Forte de Conceiçaõ, No. **7295**; and in abandoned fields at Represa do M. Pereira near the river, No. **7295***b*; July 1894.

Pungo Andongo.—Plentiful in sunny rocky places covered with

thin soil near Catete at the Washerwomen's Spring; Feb. 1857. No. **2737**. On rocky hills; Jan. 1857. No. **2771**.

MOSSAMEDES.—In sandy soil in the bed of the river Bero, which is almost entirely dried up in winter; July and August 1859. No. **2301** (in part).

Var. **viscosa** Rendle var. nov.

Panicle more rigid and robust, rhachis scabrid and pubescent, and like the branches glandular and viscid.

MOSSAMEDES.—In sandy soil in the bed of the river Bero, almost dry in the winter season; June and August 1859. No. **2301** (in part).

Var. **speciosa** Rendle var. nov.

A much finer plant than the type, 2 to 3 ft. high, culms stronger with 5 to 6 internodes, leaves flat, 2 to 4 in. long by $1\frac{1}{2}$ to 2 lines broad; panicle obtuse, ellipsoidal, 6 to 10 in. long by 2 to 3 in. across; spikelets 3 lines long, 8- to 13-flowered (generally about 10-flowered).

PUNGO ANDONGO.—In damp meadows. No. **2772**. No. **2969** (no notes).

HUILLA.—Heights of Nene; and everywhere in fields, and rather damp and dry meadows, also on the sandy banks of streams round Lopollo; April and May 1860. No. **7486**.

18. **E. beroensis** Rendle sp. nov.

Apparently annual, culms rather slender, branched, internodes 6, terete, glabrous, sometimes with a glandular ring below the subconspicuous glabrous brown nodes; leaf-sheaths subcompressed and carinate especially in the upper part, sparsely glandular-punctate, especially on the midrib, mouth sparsely pilose; ligule a short dense row of hairs; blades flat, linear-tapering, apex setiform; panicle pyramidal lax, branches whorled, becoming scattered above, weakly spreading, bare for about $\frac{1}{3}$ the distance from the base, branchlets short, weak, ascending; spikelets glabrous, linear, shortly-stalked, greyish-green, 9- to 12-flowered; barren glumes thin, membranous, acute, inconspicuously 1-nerved, the lower lanceolate, the upper ovate-lanceolate and slightly longer; fertile glumes ovate to ellipsoid-ovate, apex rounded, 3-nerved, lateral nerves curved, imperfect, pale subequal, rather narrow, slightly curved, keels glabrous; grain ellipsoidal, pale with a dark hilum.

Culms $1\frac{1}{2}$ ft. or more long, sheaths 1 to $2\frac{1}{4}$ in. long, in the fully developed culm shorter than the internodes; ligule less than $\frac{1}{4}$ line long; leaves 4 to 5 in. long by 1 line or a little more in greatest breadth, scabridulous, veins 4 to 5, prominent on under face. Panicle 7 in. long by 5 in. greatest diameter; branches in whorls of 3 to 4, or upper ones opposite, or solitary, lower about 3 in. long, becoming shorter above, nodes sparsely pilose; branchlets about 1 in. or less. Spikelets $2\frac{1}{2}$ to 4 lines long, lower barren gl. barely 1 line, upper a good line; fertile gl. $\frac{4}{5}$ line; anthers a little over $\frac{1}{2}$ line; grain $\frac{2}{3}$ line long.

Near *E. agrostoidea*, but distinguished by its laxer habit, larger laxer panicle, longer spikelets, and larger longer grain.

Mossamedes.—Sandy thickets on the river Bero ; August 1859. No. **2606.**

19. **E. rotifer** Rendle sp. nov.

An annual, 3 to 5 ft. high, with strong erect generally unbranched culms growing in tufts, and enveloped at the base by the long loose membranous sheaths which are pubescent at the very base; internodes 5, stout, terete, glabrous, with an irregular broken glandular ring below the swollen brown nodes ; mouth of sheath pilose, ligule a short dense row of hairs ; leaves long, narrow linear, tapering to a setiform apex, scabrid, flattened, plicate or subconvolute when dry ; panicle large, pyramidal, interrupted, the two lower nodes separated by a long internode and bearing a dense whorl of long very slender branches which branch again from the base upwards, succeeding internodes gradually shorter, and the branches at the nodes rapidly diminishing in number and importance ; spikelets subcompressed, narrow-linear, glabrous, terminal or on pedicels half or less than half their length, flowers 8 to 15, somewhat laxly arranged on the very slender rhachis; barren glumes unequal, light-coloured, membranous, inconspicuously 1-nerved, the lower smaller, bluntly lanceolate, reaching just above the middle of the lowest fertile glume, caducous, the upper ovate, blunt ; fertile glumes a dull brownish-green with a membranous brownish apex, broadly ovate when opened with a median and 2 incomplete faintly curved lateral nerves, apex blunt or rounded, back rounded ; pale scarcely shorter, keels minutely scabridulous in the upper part ; anthers purplish ; grain compressed, ellipsoidal, reddish-brown, hilum deeper-coloured.

Basal and lower sheaths to 5 in. long, exceeding the internodes, above the second internode about 4 in. long and shorter than the internode ; ligule $\frac{1}{5}$ line long ; leaves 9 to 18 in. long, $1\frac{1}{2}$ to scarcely 2 lines broad at the base. Panicle when fully developed 1 ft. long and 8 in. in greatest diameter, internodes between the two lowest fertile nodes, $3\frac{1}{2}$ in. long, rhachis and branches glabrous. Spikelets 3 to 4 lines long, by $\frac{1}{2}$ line broad. Lower barren gl. $\frac{1}{2}$ line, the upper $\frac{2}{3}$ to $\frac{3}{4}$ line ; fertile gl. $\frac{2}{3}$ to scarcely $\frac{3}{4}$ line long ; anthers (3) barely $\frac{1}{2}$ line ; grain $\frac{3}{8}$ line long.

Differs from the large variety of *E. agrostoidea* in its long tapering leaves, laxer spikelet and densely whorled interrupted panicle.

Barra do Bengo.—An annual, 3 to 5 ft. high, with erect culms and spreading panicles. By ponds between Quicuxe and Cacuaco ; June 1858. No. **7284.** Nos. **7341, 7341***b* (no notes).

20. **E. huillensis** Rendle sp. nov.

Perennial with a tough slender densely rooting rhizome, culms tall, erect, unbranched, with 4 internodes ; nodes glabrous not prominent ; leaf-sheaths loose, glabrous, save for a few hairs at the mouth, except the lowest generally half or less than half the length of the internode ; ligule a very short and dense row of hairs,

leaves continuous with the sheath, very narrow linear, tapering to a setiform apex, scabridulous, convolute; panicle large, ovoid, rhachis elongated bearing long, solitary, ascendo-patent distant branches, secondary branches short, appressed to the primary and bearing 2 to 5 shortly stalked spikelets; spikelets narrowly linear-oblong or lanceolate-oblong, dull olive-green, 5- to 7-flowered; barren glumes unequal, the lower bluntly ovate, enerved, or 1-nerved with a faint scabridulous keel, the upper ovate-lanceolate, subacute, strongly 1-nerved with the keel scabridulous above the base; fertile glumes broadly bluntly ovate, with a strong median and 2 sometimes imperfect curving lateral nerves which never reach the apex; pale slightly shorter, broad, with strong keels scabridulous except at the base; anthers red-brown; grain reddish; narrowly ellipsoidal with well-marked hilum.

Culms exceeding 4 ft. in length; leaves reaching 14 in. in length, width not exceeding $1\frac{1}{2}$ line at the base. Panicle 13 to 14 in. long by 4 to 5 in. across, branches spreading at an angle of 30° to 45°, the lower 5 in. long becoming shorter upwards, lowest internode $1\frac{3}{4}$ to 2 in., lowest secondary branch generally about 1 in. from the base of the primary, and $\frac{3}{4}$ to 1 in. long, the upper shorter. Spikelets about $\frac{1}{4}$ in. long; lower barren gl. $\frac{1}{2}$ to $\frac{3}{5}$ line, upper 1 line long; fertile gl. 1 to little over 1 line; anthers a little over $\frac{1}{2}$ line; grain a good $\frac{1}{2}$ line.

A striking species characterised by the large panicle with long strict distant spreading branches, and appressed branchlets, the markedly unequal barren glumes of the spikelets, and the elongated slender almost setiform leaves.

HUILLA.—Rather rare on the herb-grown banks of streams in the Lopollo district; April 1860. No. **2672**. On grassy banks of streams between Lopollo and Humpata; May 1860. No. **2627**.

21. **E. airæformis** Rendle sp. nov.

Perennial with a strong, very hard, creeping rhizome, bearing a dense terminal tuft of barren leaf-shoots and a tall erect culm; root-fibres stout, tough; culm-internodes 6, the lowest very short ($\frac{1}{2}$ in.) and the next enveloped by the loose papery glabrous leaf-sheaths, the upper half as long again or twice as long as the glabrous sheath, nodes glabrous, scarcely well-marked; ligule very short, densely hairy; leaves rigidulous, narrow linear-tapering, convolute, glabrous, scabridulous, apex setiform; panicle ovoid, branches slender, verticillate or subverticillate, sometimes solitary, weakly ascending, lateral branches filiform, short, subappressed bearing 4 or fewer, shortly stalked, dirty greenish-brown, subcompressed, scarcely compact, linear, generally 6- to 8-flowered spikelets; barren glumes subscarious, pale, rather narrowly ovate, blunt, 1-nerved, the narrow keel scabridulous above the base, the lower about $\frac{1}{5}$ shorter than the upper; rhachilla tough; fertile glumes with a pale brownish scarious tip, ovate, blunt, 3-nerved, lateral nerves curved and falling short of the apex, midrib minutely scabridulous above the middle; pale broad, slightly

shorter than the glume, keels minutely scabridulous above the middle; grain reddish, ellipsoidal.

Culm nearly 5 ft. high; basal sheaths to 3 in. long, the upper $3\frac{1}{2}$ to 9 in.; leaves 6 to 12 in. long, greatest width scarcely $1\frac{1}{2}$ line. Root-fibres a good line in diameter. Panicle 11 to 13 in. long, by 3 to 4 in. greatest diameter, lowest node hairy, branches $5\frac{1}{2}$ in. long or less, branchlets $\frac{3}{4}$ in. or less; spikelets generally $2\frac{1}{2}$ to 3 lines long; lower barren gl. $\frac{3}{4}$ to $\frac{4}{5}$ line, upper nearly 1 line long; flowering glumes 1 line; anthers $\frac{2}{5}$ line; grain $\frac{1}{2}$ line.

Near the last species (*E. huillensis*) which it closely resembles in stem- and leaf-characters, but is distinguished by its more delicate *Aira*-like panicle, with whorled branches, less robust spikelets, and subequal barren glumes.

Pungo Andongo.—Pedras de Guinga; Jan. 1857. No. **2749**.

22. **E. curvula** Nees Fl. Afr. Austr. p. 397 (1841).

Var. **decorans** Rendle var. nov.

*E. decorans* Welw. ms. in herb.

A fine plant over 2 ft. high, with long rigidulous linear-tapering flattened to subconvolute leaves and a somewhat stronger panicle than in the type, over 8 in. long; spikelets slightly broader than in the type, with slightly larger blunter more elliptical fertile glumes.

Huilla.—A common grass in the interior highlands used by the negresses as bracelets. Plentiful on the margins of fields in the Lopollo district; Jan. and Feb. 1860. No. **2645**.

23. **E. densiflora** Rendle sp. nov.

A cæspitose annual, culms spreading-ascending then erect, often branched, nodes brown, glabrous, internodes 5 to 6, slender but strong, terete, glabrous, except the uppermost subequal and not elongated; sheaths, except the lowest, $\frac{1}{5}$ to $\frac{1}{2}$ shorter than the internode, subcompressed, glabrous; ligule a short dense row of hairs; blades rigidulous, glabrous, ascending, linear-tapering, becoming convolute, apex subsetiform; panicle very dense, flexuose, linear-lanceolate, rhachis slender, branches filiform, whorled and scattered, suberect, nodes glabrous; branchlets short, appressed, bearing 2 to 4 shortly stalked spikelets; spikelets narrow, linear, compressed, 14- to 20-flowered, dull purplish-green; barren glumes unequal, the lower small, lanceolate, blunt, 1-nerved, sometimes enerved, scarious, caducous, the upper lanceolate, acute, 1-nerved, carinulate and scabridulous in the upper two-thirds, margins and apex scarious; fertile glumes ovate, blunt, 3-nerved, lateral nerves imperfect, minutely scabridulous dorsally below the apex, tip scarious, brownish; pale slightly shorter, keels scabridulous in the upper third, anthers brown; grain reddish, laterally subcompressed, ellipsoidal.

Plants scarcely $1\frac{1}{2}$ ft. high; internodes except the uppermost $1\frac{1}{4}$ to 2 in. long, by $\frac{1}{2}$ to $\frac{2}{4}$ line in diameter, the sheaths $\frac{3}{4}$ to $1\frac{1}{4}$ in., ligule barely $\frac{1}{4}$ line long, leaves $1\frac{1}{2}$ to 3 in. long, by 1 line or less

in breadth. Panicle 4 to 5 in. long by $\frac{2}{3}$ to barely 1 in across, lowermost branches reaching $2\frac{1}{2}$ in. becoming shorter upwards. Spikelets $\frac{1}{8}$ in. or rather less, by $\frac{1}{2}$ line wide; lower barren gl. $\frac{1}{2}$ line, upper $\frac{3}{4}$ line; fertile gl. $\frac{3}{4}$ line long; anthers $\frac{1}{3}$ to $\frac{3}{8}$ line, grain a good $\frac{1}{3}$ line.

A very distinct species characterised by its narrow densely crowded panicle, and long narrow-linear many-flowered spikelets.

Mossamedes.—Rather dry sandy places between the fortified town of Mossamedes and Mata dos Carpinteiros; towards the end of June 1859. No. **2597**.

24. **E. quadriflora** Rendle sp. nov.

Annual, cæspitose, culms unbranched, erect or with an ascending base and rooting at the lowest node, internodes 7, subcompressed, except the uppermost which bears the panicle glabrous and polished, increasing regularly in length from the lowest upwards, with a glandular ring just below the glabrous purplish nodes; sheaths compressed, loose, papery, striate, glabrous except for a conspicuous tuft of hairs at the mouth and a few short hairs along the margins, conspicuously glandular-punctate; ligule a short dense row of hairs; blades stiff, linear-tapering, acute, convolute, upper face sparsely pilose, lower face glazed and glabrous; panicle narrowly lanceolate in outline when fully developed, rhachis scabridulous-pubescent, branches filiform, scabridulous, tinged like the rhachis with dull purple, multiverticillate at the lowest node, scattered or pseudo-verticillate above, ascending and curving gracefully outwards, branched almost from the base, lateral branches short bearing 2 spikelets and passing above into single shortly stalked spikelets; spikelets lanceolate to lanceolate-oblong, compressed, 4- to 5-flowered, dull greenish-purple; barren glumes lanceolate, acute, carinulate and scabridulous above the base, 1-nerved, margin and apex hyaline, the lower reaching to within $\frac{1}{4}$ to $\frac{1}{5}$ of the tip of the lowest fertile glume, about $\frac{1}{5}$ shorter than the upper; fertile glumes ovate, blunt, 3-nerved, marginal nerves imperfect, glabrous, pale slightly short, broad, slightly curved, keels scabridulous just below the apex only.

Culms about $2\frac{1}{2}$ ft. high, lower internodes reaching $1\frac{1}{2}$ line in diameter, sheaths from $1\frac{1}{4}$ to 4 in. long, the lower subcarinate and reaching nearly 2 lines in width, the upper narrower, longer, and less compressed; ligule a good $\frac{1}{3}$ line; leaves 4 to 6 in. long, the lower 2 lines in width at the base. Panicle 8 to 9 in. long by $1\frac{1}{2}$ in. greatest width, branches at the lower nodes reaching 2 in. long, branchlets $\frac{1}{4}$ to $\frac{1}{3}$ in. or less; spikelets $1\frac{1}{3}$ to 2 lines long, the pedicel of the lateral spikelets rarely exceeding $\frac{1}{2}$ line, often less, the terminal on pedicels equal to or generally 2 to 3 times their own length. Barren glumes $\frac{4}{5}$ line and 1 line respectively; the upper reaching to above the middle of the second fertile glume; fertile glume $\frac{2}{3}$ line long; anthers brown, scarcely $\frac{1}{2}$ line long; grain not developed.

A distinct species, perhaps nearest *E. micrantha* Hack., but a

much larger plant with broader leaves, longer and stronger panicle with pubescent rhachis, etc.

HUILLA.—Somewhat plentiful in abandoned fields after *Sorghum* cultivation near Eme, and at Ivantâla ; May 1860. No. **7489**.

25. **E. habrantha** Rendle sp. nov.

Apparently annual, cæspitose ; culms unbranched, erect, with a distichous tuft of basal leaves, internodes except the flowering reduced, sheaths chartaceous, the outer subcompressed, stiff, polished, hairy at the mouth, persistent, the upper becoming narrower and cylindrical ; ligule a very short dense row of hairs ; blade suberect to ascending, jointed to the sheath, stiff, narrow-linear and convolute, tapering to the setaceous apex, obscurely striate, glabrous ; panicle narrowly oblong, purple, nodes bearing a tuft of white hairs, branches solitary or in fascicles (often in opposite pairs) at the nodes, filiform, ascending, bearing from the base upward capillary branchlets, which may again branch, spikelets long-stalked, minute, obovate, compressed, 2- sometimes 3-flowered ; barren glumes subequal, reaching almost to the top of the flowering glumes, elliptical, blunt, 1-nerved, vein sparsely scabridulous below the apex only, purplish with pale apex and margin ; flowering glume broadly elliptical, with rounded apex, 1-nerved, with marginal nerves very imperfect or obsolete, ecarinate, glabrous, purplish and green ; pale equal, truncate, keels well marked, scabridulous only in upper third ; anthers purple.

Plants less than 2 ft. high ; leaf-bearing stem less than 1 in. long ; sheaths $1\frac{1}{2}$ to 7 in. long enveloping the flowering internode almost to the base of the panicle ; leaves reaching 1 ft. in length, $\frac{1}{2}$ to scarcely 1 line broad in their natural convolute state. Inflorescence 1 ft. long by $1\frac{1}{2}$ in. broad, lowest branches reaching 4 in. long, forming an elegant capillary panicle ; spikelets $\frac{1}{2}$ to $\frac{2}{3}$ line long, on pedicels 3 to many times their length ; barren glumes $\frac{1}{2}$ to $\frac{3}{5}$ line long, the lower sometimes slightly the smaller ; fertile glumes $\frac{1}{2}$ line or a little more ; anthers $\frac{1}{4}$ to $\frac{1}{3}$ line.

Recalls *E. biflora* Hack. (Transvaal) in its minute few-flowered spikelets, but is a statelier plant distinguished at once by its long rigidulous leaves and erect narrowly oblong purple nebulous panicle, and still smaller spikelets.

HUILLA.—In thicket-grown fields, no longer cultivated, near Lopollo ; April 1860. No. **7493**.

26. **E. Frederici** Rendle sp. nov.

Perennial (?), cæspitose, culms subrobust, erect, unbranched, densely sheathed at the base, cauline internodes 4 (the lowest short), terete, glabrous, internodes glabrous, purplish ; sheaths loose, pilose at the mouth, shorter than the 3 upper internodes ; ligule a short line of hairs ; blades ascending to erect, rigidulous, convolute, tapering from a broader base to a setaceous apex, sparsely scabridulous-pilose ; panicle oblong, subeffuse, rhachis and branches scabridulous-pilose, the latter alternate, slender, bearing filiform branchlets from the base upwards ; pedicels shorter

than the spikelets, the latter a slatey blue, compressed, lanceolate, 5- to 6-flowered; barren glumes long, lanceolate, acute, 1-nerved, glabrous, keel minutely scabridulous, the lower a little shorter and less acute; fertile glumes ovate-lanceolate, subobtuse, lateral nerves strong, scabridulous-pilose, keel minutely scabridulous; pale a little shorter, elliptical, blunt, keels scabridulous-pilose.

An elegant plant with a *Poa*-like habit. Culms young, with the panicle not yet fully expanded, $1\frac{1}{2}$ to $1\frac{3}{4}$ ft. high, a little over a line in thickness at the base, the lowest internode completely hidden by several basal sheaths, less than 1 in. long, the second 3 or more in. long; leaf-blades reaching $5\frac{1}{2}$ in. long by 2 lines broad at the base. Panicle not fully developed, 7 in. long by $1\frac{3}{4}$ greatest width, lower branches 2 to 3 in. long, the upper becoming shorter; spikelets barely 3 lines long by $\frac{3}{4}$ line broad; lower barren glume 1 line long, the upper $1\frac{1}{3}$ to $1\frac{2}{3}$ line, about equal in length to the lowest fertile glume; anthers $\frac{2}{3}$ line long; grain not yet developed.

A distinct species characterised by its *Poa*-like inflorescence, hairy rhachis and spikelets, and long acute barren glumes.

Huilla.—In wooded meadows near Lopollo; Jan. 1860. No. **2631**.

27. **E. fascicularis** Trin. in Mém. Acad. Imp. Sci. Pétersb. ser. 6. i. p. 403 (1830) (e descript.); Steud., *l.c.*, p. 270; Durand & Schinz, *l.c.*, p. 883.

? *E. benguelensis* Wawr. & Peyr. in Sitzungsber. Math.-Nat. Cl. Acad. Wiss. Wien. xxxviii. p. 583 (1859), (Sertum benguelense, p. 43 [1860]); Durand & Schinz, *l.c.*, p. 880. *Poa fascicularis* Kunth Enum. i. p. 339 (1833).

Ambriz.—In sunny sandy places, even the most sterile, near Ponta d'Ambriz in West Congo, remarkably social; Nov. 1853. No. **2893**. Native name, Sangalalâ.

Barra do Dande.—A perennial grass 3 to 6 ft. high, culms decumbent with erect fascicles of branchlets, or densely cæspitose and erect, 4 to 5 or even 6 ft. high, fasciculately branched at the apex, culms and branches polished, very tough. Spikelets greenish, culms and sheaths viscous and resinous at the base. Very plentiful all along the shore from Loanda to Ambriz, especially in sandy, sparsely herb-grown places; very plentiful in the dry palm-groves of Praia de S. Thiago to the south of the river Dande; Sept. 1858. No. **7312**. Native name, Sangalalâ.

Loanda.—Culms becoming spirally twisted or bent with age. Ubiquitous and very plentiful and remarkably social in poor sandy soil, etc., throughout the whole province of Loanda. Alto das Cruzes, May 1854. No. **7473**. Called by the Portuguese and negroes, Sangalalè. Exceedingly dangerous to sportsmen on account of its twine-like runners. Used in lime-burning, since on account of its great elasticity it serves as layers between the Mubanga-layers of the kiln. (Mubanga or Mubango is *Acacia Welwitschii* Oliv.; see ante, vol. i., p. 310.) Seen in January 1858 at the Museque Lopes, Ilha da Loanda. Nos. **7366**, **7366***b*, etc.

Mossamedes.—Sandy maritime places but much rarer than in Loanda. Near the gardens, July 1859. No. **2297**. Called by the inhabitants Sangalalâ.

Sāngălălā, sometimes pronounced Sāngălălé (plural Massangralâ), is the name which the negroes who inhabit the maritime territory of Angola give to a kind of hay-grass, very plentiful along the coast, which on account of its mode of growth becomes very dangerous to travellers, because the stems are habitually curved in the form of bows, rooting at their extremities and constituting at intervals natural snares which cause the unwary to fall to the ground.

This grass is so stiff, and its stems have so hard a fibre, that the negroes of Angola use it almost exclusively for tooth-brushes; the negresses in returning to their huts from water-carrying or other occupations are seen almost always busy polishing their teeth with Sangalala.

28. **E. chalcantha** Trin., *l.c.*, p. 401; Steud., *l.c.*, p. 270; Durand & Schinz, *l.c.*, p. 881.

Pungo Andongo.—A cæspitose grass with strict culms, 1 to 2 ft. high. On the grassy slopes of the higher rocks of the præsidium; 18 Dec. 1856. No. **2756**. Nos. **2864**, **2876**, **2965** (no notes).

Huilla.—Abandoned fields near Ferrão da Sola; Feb. 1860. No. **7510**. In pastures behind Lopollo; Feb. and May 1860. No. **7520**.

Var. **effusa** Rendle var. nov.

Distinguished from the type by its effuse panicles, the branches of which spread at angles between 45° and a right angle, and slightly more acute flowering glumes.

Panicle to 5 in. in length by $2\frac{1}{2}$ in. across, rhomboid-ovoid; the spreading shortly stalked spikelets slightly rufescent, lanceolate to lanceolate-oblong in shape, and about $\frac{1}{3}$ in. long by $1\frac{1}{2}$ line broad.

Pungo Andongo.—Dec. 1856. No. **2760**.

29. **E. microsperma** Rendle sp. nov.

A cæspitose annual, culms ascending at the base then erect, internodes 5, subterete, glabrous, except the uppermost (flowering) short; nodes pale brown, glabrous; sheaths and leaves rufescent, lower sheaths broad, loose, subcompressed, enveloping the internodes, the upper becoming terete, margins and mouth pilose, veins bearing scattered whitish glands in the upper portion; ligule a short dense row of hairs; blades linear-lanceolate, acuminate, rigidulous, scabridulous especially on the lower face, sparsely pilose; flowering internode much elongated carrying the panicle far above the leaves; panicle oblong, subeffuse, branches slender, alternate, regular, spreading, bearing from the base upwards the long-stalked spreading spikelets, pedicel with a median annular gland, filiform, exceeding the spikelet, spikelets tremulous, lanceolate to oblong-lanceolate, blunt, subcompressed, polished, *Briza*-like; barren glumes membranous and 1-nerved, scabridulously carinulate above the middle, the lower slightly shorter, orbicular-ovate, blunt, the upper orbicular, slightly bluntly apiculate; flowering glumes membranous, transversely orbicular-ellipsoidal, nerves weak, glabrous; pales slightly shorter, persistent, hyaline, purplish, keels hispidulous; grain minute, globose, with a symmetrical subbasilar hilum, transparent reddish, surface reticulate.

Culms $1\frac{1}{2}$ ft. long, internodes (except the uppermost) increasing upwards from $\frac{1}{4}$ to $1\frac{3}{4}$ in. long, sheaths from $\frac{2}{3}$ to $1\frac{3}{4}$ in.; ligule $\frac{1}{5}$ line long; leaf-blades $1\frac{1}{4}$ to $3\frac{1}{2}$ in. long by $1\frac{1}{2}$ to 3 lines broad. Panicle 6 to 7 in. long, by about 2 in. in diameter, branches reaching $1\frac{2}{3}$ in. in length becoming shorter near the base and apex; pedicels of the lateral spikelets 2 to 4 lines long, of the perennial often exceeding $\frac{1}{2}$ in. Spikelets 2 to 3 lines long by 1 line or a little more in breadth; barren gls. $\frac{1}{2}$ and $\frac{3}{5}$ line respectively; fertile gl. $\frac{2}{3}$ line long by a good $\frac{3}{4}$ broad; anther $\frac{1}{2}$ line long; grain $\frac{1}{5}$ line in diameter.

A very distinct species characterised by its rufescent linear-lanceolate leaves, and delicate long-stalked somewhat *Briza*-like purplish spikelets, with broad blunt flowering glumes and very small grain. It resembles somewhat the more effuse smaller-spikeleted forms of *E. chalcantha* Trin., but differs in its tremulous more delicate spikelets with broader glumes and smaller grain.

Pungo Andongo.—A beautiful grass, annual, cæspitose, culms ascending at the base, spikelets purplish. By sandy road-sides from Quicuxe towards Cacuaco; June 1858. No. **7279.**

30. **E. vacillans** Rendle sp. nov.

Stem forming a slender creeping rhizome at the base; culms erect from an ascending base, branched, internodes 4 to 6, glabrous, except the uppermost comparatively short and not or only slightly exceeding the loose compressed purplish sheath, sheaths and leaf-blades scabridulously pilose, especially when young; ligule a short dense row of hairs; blades flat, short, narrowly linear-lanceolate, acute; panicle ellipsoidal, diffuse, branches glabrous like the rhachis, slender, scattered (lowest sometimes whorled) flexuously ascendo-patent, bearing spikelets or more rarely short branches from the base upwards; pedicels long, filiform, glandular; spikelets small, 8- to 11-flowered, ovate, dull brownish-green, tremulous; barren glumes sparsely pilose, the lower small, enerved, lanceolate to ovate from a truncate base, blunt, caducous, reaching to the middle of the lowest fertile glume, the upper broadly ovate, 1-nerved, reaching to within $\frac{1}{3}$ of the tip of the second fertile glume; fertile glumes inflated, suborbicular, blunt, pilose outside the submarginal lateral nerves; pale subequal, elliptical when flat, keels very faintly scabridulous in the upper half, transparent green.

Culms $1\frac{1}{2}$ ft. or less in length, internodes on the longest culm (below the flowering) $\frac{1}{2}$ to $1\frac{3}{4}$ in. long, not exceeding 1 line in thickness, terete or longitudinally grooved above a branching node; blade $\frac{3}{4}$ to $2\frac{1}{2}$ in. long by two lines or less in width. The largest panicle 6 in. long by 3 in. in diameter, with branches reaching 2 in. long, curving outwardly at about half a right-angle; pedicels equal to or longer than, rarely shorter than the spikelets, of the terminal spikelets often twice as long; spikelets barely reaching 2 lines long by $1\frac{1}{4}$ broad, lower barren gl. barely

$\frac{1}{2}$ line, upper $\frac{3}{5}$ to $\frac{3}{4}$ line; fertile gl. $\frac{3}{4}$ line long by a good $\frac{2}{3}$ line broad; anthers a warm reddish-brown, $\frac{1}{2}$ line long.

Near the Sierra Leone *E. Scotelliana* Rendle, which closely resembles it in panicle and spikelet. The Huilla plant is however easily distinguished by its broader shorter flattened scabridulous hairy leaves, smaller, greenish-brown spikelets and markedly unequal barren glumes.

Huilla.—In fields and among plantations of *Zea Mays* near Lopollo; Jan. 1860; No. **2646**. In short thicket-grown sandy pastures in the Humpata district; April 1860. No. **7504**.

31. **E. rejuvenescens** Rendle sp. nov.

A small plant; culms very slender, wiry, glabrous, springing from a dense bulbiform tuft formed by broad strongly membranous striate persistent sheaths enveloping the new shoots, outer face of sheaths densely woolly; ligule a short very dense row of hairs; blades of new leaves short, narrowly convolute, more or less falcate, rigid, pungent, glabrous; panicle small, subeffuse, ovoid, or ellipsoid, rhachis, branches and pedicels glabrous, glandular; branches short rigidulous, ascendo-patent bearing slender small branchlets or spikelets on subequal or slightly shorter pedicels; spikelets 6- to 8-flowered, bluntly ovate; barren glumes large, subequal, reaching almost to the tip of the lower fertile glumes, lanceolate, blunt, 1-nerved, subhyaline, glabrous; fertile glumes glabrous, ovate, blunt, concave, lateral nerves marginal; pale slightly shorter, back elliptical-oblong when flattened, truncate, keels glabrous, inflexed margins externally ciliate in the upper two-thirds; grain ellipsoidal, smooth, pale brown, hilum basilar.

Plants 5 to $6\frac{1}{2}$ in. high; root-fibres numerous, strong, $\frac{1}{2}$ to $\frac{2}{3}$ line thick; outer sheaths bearing the charred remains of leaves, about 1 in. long, $\frac{1}{4}$ in. broad, the inner becoming shorter; leaves 7 to 14 lines long, barely $\frac{1}{4}$ line in diameter. Flowering internode with panicle 3 to 5 in. long, panicle 12 to 14 lines long by 8 to 11 lines across; branches $\frac{1}{2}$ in. or less; spikelet $1\frac{1}{2}$ line long by a little over 1 line broad; barren and flowering glumes barely 1 line long; grain barely $\frac{1}{3}$ line.

Recalls the last species in the form of its spikelets, which however differ in the glabrous glumes and ciliate pale. Its habit is very distinct.

Huilla.—In short thicket-grown pastures, recently burnt, near Mumpulla; Oct. 1859. No. **2661**.

32. **E. Chapellieri** Nees Fl. Afr. Austr. p. 392 (1841); Steud., *l.c.*, p. 271; Durand & Schinz, *l.c.*, p. 881.

Loanda.—1853-4. Nos. **7363**, **7363***b*, **7363***c*, **7363***d*. No. **7334** (no notes).

Pungo Andongo.—In sandy wooded places near Sansamanda on the banks of the Cuanza; 1 May 1857. No. **7404**. Calunda; Jan. 1857. No. **2750**. No. **2904** (no notes).

Huilla.—Edges of fields near Humpata: April 1860. No. **2695**.

33. **E. patens** Oliv. in Trans. Linn. Soc. xxix. p. 175, t. 113 (1875); Durand & Schinz, *l.c.*, p. 887.

Golungo Alto.—Found occasionally at the edges of Gramineta (Capim) between Sange and Menha-lula; May 1855. No. **7268**.

Huilla.—Very plentiful in abandoned fields, especially in rich soil; end of April 1860. No. **7498**.

34. **E. plana** Nees Fl. Afr. Austr. p. 390 (1841); Steud., *l.c.*, p. 270; Durand & Schinz, *l.c.*, p. 888.

Pungo Andongo.—Rather dry meadows near Sansamanda; Feb. 1857. No. **2776**.

35. **E. brizoides** Nees in Linnæa vii. p. 328 (1832), Fl. Afr. Austr. p. 384 (1841); Steud., *l.c.*; Durand & Schinz, *l.c.*, p. 880.

Pungo Andongo.—2 ft. high, widely cæspitose, with erect culms and somewhat fleshy broadly ovate yellowish-red spikelets. In spongy boggy places on the higher rocks of the south side of the præsidium; 18 Dec. 1856. No. **2757**. Calunda; Jan. 1857. No. **2748**.

Huilla.—Leaves smooth. Thicket-grown pastures near Nene; Oct. 1859. No. **7518**. Leaves markedly pilose. Rather dry pastures near Humpata; April 1860. No. **7519**. A form with hairy leaves.

Sect. 3.—Platystachya.

36. **E. superba** Wawr. & Peyr. in Sitz. Akad. Wiss. Wien xxxviii. p. 584 (1860), (Sertum Benguelense p. 44); Durand & Schinz, *l.c.*, p. 890.

*E. elata* Munro ex Hiern & Ficalho in Trans. Linn. Soc. Ser. 2. ii. p. 32.

Ambriz.—Nov. 1853. No. **2896**.

Loanda.—A very elegant cæspitose grass, sometimes annual, sometimes when the rains are favourable biennial or even perennial; representing *Briza maxima* in the equatorial zone; culms ascending, branched, 1 to 3 ft.; spikelets compressed, many-flowered, very large, compact, generally variegated with green, purple and crimson. Plentiful in sandy cultivated places, and in wild uncultivated places throughout the whole district of Loanda, in herb-grown and grassy places both in sandy and rich soil, flowering almost the whole year; June 1858. No. **7311**. Maianga do Povo; July 1858. No. **7311***b*. Alto das Cruzes, Dec. 1858. No. **7311***c*. 1853-4. Nos. **7365**, **7365***b*, **7365***c*, **7365***d*. Represa do Maghellaõ Conceiçaõ; 10 Aug. 1854. No. **7447**.

37. **E. variegata** Welw. ms. in herb.

A small very elegant annual, culms slender, spreading-ascending, geniculate, branched, internodes 4, like the nodes sparsely scabridulous and pilose; sheaths except the lowest about half the length of the internodes, broader and looser below, becoming cylindrical above, more or less pilose; ligule a line of hairs; blades short, flat, narrowly linear-lanceolate, acute, margin scabrid, upper face scabridulous, lower pubescent, panicle oblong to pyramidal; branches few short, triquetrous and hirsutulous bearing a congested cluster of 2 to 6 large, flattened, sessile, ovate-lanceolate to oblong many-flowered spikelets; barren glumes similar to but shorter and narrower than the fertile, ovate-acuminate, 1-nerved,

the keels conspicuously scabridulous in the upper $\frac{2}{3}$ and as in the flowering glumes forming cuspidate apices, the upper slightly larger with ciliolate margin; flowering glumes membranous, densely imbricate on the stout obscurely articulate rhachis, very broadly ovate, violet, lateral nerves strongly marked up to about the middle, ceasing below the apex; pale much smaller, hyaline, keels deep violet, scabridulous, back oval when flattened.

Described by Welwitsch as of a splendid violet colour when alive, and by far the most elegant grass which he collected in Africa. Plants not exceeding 8 in. in height, lower internodes rarely exceeding $\frac{1}{2}$ line in thickness, sheaths $\frac{1}{4}$ to barely 1 in. long; ligule about $\frac{1}{2}$ line long; leaves reaching $2\frac{1}{4}$ in. long by $1\frac{2}{3}$ line broad. Panicle $1\frac{1}{2}$ to 3 in. long by $\frac{3}{4}$ to nearly 2 in. broad, branches 5 or fewer, $1\frac{1}{3}$ in. long or less. Spikelets $\frac{1}{3}$ to $\frac{2}{3}$ line long by $\frac{1}{4}$ in. or little more in breadth, with 20 to 30 flowers; barren glumes $1\frac{1}{2}$ and $1\frac{2}{3}$ line respectively, fertile glumes from $1\frac{1}{2}$ to 2 lines long and 1 to $1\frac{1}{3}$ line broad, pale from 1 to barely $1\frac{1}{6}$ line; anthers reaching $\frac{2}{4}$ line.

A very well marked species allied to *E. superba* Wawr. & Peyr., but distinguished at once by its longer spikelets, characteristic cuspidate glumes, etc.

Mossamedes and Cabo Negro.—On dry low hills near Villa de Mossamedes, growing plentifully with *Euphorbia*, but almost past flowering; beginning of July 1859. No. **2300**.

38. **E. cylindrispica** Rendle sp. nov.

A cæspitose annual, culms erect, slightly spreading at the base, branched, internodes 3 to 5, except the flowering short, glabrous, subcompressed; nodes brownish, glabrous; sheaths compressed, striate, scabridulously pilose like the leaf-blades, the lower exceeding the internodes, the upper (next to the flowering) about $\frac{1}{3}$ to $\frac{1}{4}$ shorter; ligule a line of hairs barely 1 line long; blades narrowly linear-lanceolate, tapering, acute, membranous when dry, prominently 5- to 7-veined on the lower face, which is especially scabrid; panicle narrow, almost cylindrical, rhachis strong, glabrous, with 2 well-marked lateral furrows in each of which is inserted a row of shortened branches bearing 5 to 2 sessile, flattened, ovate spikelets of 14 to 20 densely packed florets; rhachis articulate between the glumes; barren glumes resembling the fertile but generally narrower with a longer cusp, ovate, 3-nerved, with strong scabridulous keels passing above into the linear cusp, subequal; fertile glumes coriaceous, yellowish-green, orbicular-ovate, very concave, abruptly acute, apex strong, lateral nerves reaching almost to the tip, keeled in the upper $\frac{2}{3}$, upper part of keel minutely scabridulous; pale slightly shorter, membranous, very broad, rhomboidal-ovate from the strong broadly winged keels the edges of which often project beyond the glumes, veins strong, not carinate.

A rather stiff but elegant plant, culms reaching 15 in. in length, internodes (excluding the flowering) from $\frac{1}{3}$ to $1\frac{1}{2}$ or sometimes

nearly 3 in. long; leaf-blades $1\frac{1}{2}$ to 4 in. long by 1 to 2 lines broad. Panicles 5 to $7\frac{1}{2}$ in. long, generally between $\frac{1}{2}$ and $\frac{3}{4}$ in. in diameter, branches rarely reaching 1 in. in length, ascending, the greater number bearing only 3 or 2 spikelets, reduced near the top of the rhachis to single spikelets. Spikelets 3 to 5 lines long, 3 or barely 3 lines broad at the base; barren glumes sometimes tinged with purple, $1\frac{3}{4}$ to 2 lines long; fertile $1\frac{2}{3}$ to $1\frac{3}{4}$ line long and as broad; pale $1\frac{2}{3}$ to $1\frac{2}{3}$ line long by about $1\frac{1}{3}$ line broad; anthers pale brown, a little over $\frac{1}{2}$ line long.

Allied to *E. superba* Wawr. & Peyr. but with considerable differences the most striking of which are the sessile spikelets, acute glumes, broader pales, and hairy leaves.

Huilla.—Plentiful in sandy pastures grown with short thickets by edges of woods at Monino; April 1860. No. **7506**.

39. **E. flavicans** Welw. ms. in herb.

A very elegant grass, annual, cæspitose, culms slender, erect from a spreading ascending base, with numerous short internodes, geniculate, profusely branched at the lower nodes, internodes terete or subcompressed, glabrous, the lower enveloped by the subcompressed leaf-sheaths, the upper exceeding them; sheaths with pilose edges and mouth, the lower sparsely scabridulously pilose in the upper part; ligule a very short dense line of hairs; blades flat, narrowly linear-lanceolate, acuminate, rigidulous, scabridulously pilose, especially on the lower face on the 5 to 7 prominent veins; panicle narrowly cylindrical, closely resembling that of *E. cylindrispica*, the glabrous rhachis bearing short reduced lateral branches distichously arranged in 2 longitudinal furrows; spikelets compressed, spreading, yellowish-green, lanceolate, or ovate-lanceolate, densely 10- to 17-flowered, rhachis jointed below each flower; barren glumes equal in length and similar to the fertile but narrower and acuminate, ovate, imperfectly 3-nerved, keel strong and scabridulous in the upper $\frac{1}{2}$ to $\frac{2}{3}$, the upper broader and a shade longer; fertile glumes orbicular-ovate, shortly acute, lateral nerves prominent, keeled and minutely scabridulous above the middle; pale slightly shorter, narrowly obovate when flattened, truncate, keels membranously winged; anthers yellowish; grain reddish-brown, reticulated, ellipsoidal, laterally subcompressed with prominent basilateral hilum.

Described by Welwitsch as a very elegant plant when alive, remarkable not only by its yellowish spikelets, but also its greenish-yellow leaves and culms. Plants 14 to 16 in. high, internodes increasing in length upwards from $\frac{1}{4}$ to $1\frac{3}{4}$ to $2\frac{1}{2}$ in., from $\frac{1}{3}$ to over $\frac{1}{2}$ line thick; ligule barely $\frac{1}{8}$ line long; leaves 1 to $2\frac{1}{2}$ in. long by 1 line or a little more broad. Panicle $3\frac{1}{2}$ to $5\frac{2}{3}$ in. long, by $\frac{1}{2}$ to $\frac{3}{4}$ in. across, sometimes tapering slightly upwards; lowest branch to $\frac{3}{4}$ in. long, often with 5 spikelets, becoming reduced above to 3, 2 and finally single spikelets. Spikelets 3 to 4 lines long by 2 lines or less in breadth; barren and fertile glumes 1 line long; anthers a good $\frac{1}{2}$ line; grain barely $\frac{1}{3}$ line.

Near *E. cylindrispica*, which it closely resembles in habit, but is a less robust plant with smaller less coriaceous spikelets and pales with much more narrowly winged keels.

PUNGO ANDONGO.—In sparse-grassed rocky thickets between Catete and Luxillo; 28 April 1857. No. **2735**. In rather damp sandy thickets near Luxillo; April 1857. No. **2734**. In sandy thickets near Cazella and on the banks of the river Lutete; April 1857. No. **2818**.

40. **E. guingensis** Rendle sp. nov.

Cæspitose apparently perennial with a strong slender woody rhizome; culms tall slender, erect, terete, glabrous, springing from a tuft of slender erect convolute almost acicular sparsely scabridulous-hairy leaves, surrounded at the base by the withered sheaths; panicle elongated, strict, branches subdistantly alternate, erect, bearing the flattened ovate to elliptic-ovate purplish-green subsessile 8- to 11-flowered spikelets or reduced branchlets from a short distance from the base upwards, rhachis articulate between each flower; glumes spreading, the barren generally slightly shorter than the fertile, subequal, ovate-lanceolate, acute, keels scabridulous with strong apex, imperfectly 3-nerved, lateral nerves weak; fertile glumes subcoriaceous, ovate-acute, lateral nerves well-marked in the lower half; pale slightly shorter, keels prominent, shortly scabridulous, back narrowly elliptical when flattened, apex truncate.

Plants reaching about 2 ft. high; culms with 3 internodes, the lowest very short ($\frac{1}{3}$ in.), the median 2 in. or less, the uppermost very much elongated and bearing the inflorescence, the 2 lower enveloped by the narrow cylindrical sheaths, pilose at the mouth only; ligule a very short hairy ridge, blades reaching 6 in. in length rarely exceeding $\frac{1}{2}$ line in diameter. Panicles reaching 15 in. long, by $\frac{1}{2}$ to 1 in. broad; lower branches $2\frac{1}{2}$ to $3\frac{1}{2}$ in. long; spikelets $\frac{1}{4}$ to $\frac{1}{3}$ in. long by 2 to $2\frac{1}{4}$ lines broad; barren glumes $1\frac{1}{4}$ line long, fertile glumes $1\frac{1}{2}$ line; anthers purplish-brown $\frac{2}{3}$ line.

Near *E. flavicans* Welw. but distinguished by its narrow acicular leaves and longer strictly branched panicle.

PUNGO ANDONGO.—A strictly erect grass with the habit of *Poa*, 2 ft. high, growing sparsely in rock-crannies at Pedras de Guinga; Jan. and March 1857. Nos. **7407**, **7414**. No. **2865** (no notes).

Var. **egregia** Rendle var. nov.

Plants 3 to 4 ft. high, with flattened linear or convolute leaves over a foot in length and reaching 2 lines in breadth; panicle immature, over $1\frac{1}{2}$ ft. long, resembling that of the type but on a larger scale.

Perhaps a distinct species but the spikelets are insufficiently developed for description.

PUNGO ANDONGO.—A grass 3 to 4 ft. high, growing cæspitosely in the rocks of Pedras de Guinga and near Calundo, which consist of sandy black very hot schist; Jan. and March 1857. No. **2759**.

Specific determination is impossible in the case of the following numbers, as the inflorescence is immature.

Golungo Alto ?—No. **7222** (no information).
Pungo Andongo ?—No. **2840** (no information).
Huilla.—In herb-grown woods between Eme and Ivantâla ; Feb. 1860. No. **7503**.

Tribe XIII. *FESTUCEÆ*.

68. **FESTUCA** L. ; Benth. & Hook. f. Gen. Pl. iii. p. 1198.

1. **F. abyssinica** Hochst. in Flora xxiv. Intell. i. p. 20 (1841) (nomen) ; A. Rich. Tent. Fl. Abyss. ii. p. 432 (1851).

Var. **acuta** Rendle var. nov.

Panicle stricter than in the type with slightly narrower barren glumes and shortly stalked flowering glumes.

Huilla.—Wooded meadows between Monino and Lake Ivantâla, on the way to Quipungo in thicket-grown pastures ; Feb. 1860. No. **2630**.

Tribe XIV. *HORDEÆ*.

69. **LOLIUM** L. ; Benth. & Hook. f. Gen. Pl. iii. p. 1202.

1. **L. temulentum** L. Sp. Pl. p. 83 (1753).

Var. **leptochæton** A. Br. in Flora xvii. p. 252 (1834).

Var. *speciosum* Coss. in Coss. & Dur. Expl. Sci. Algér. ii. p. 195. Var. *muticum* Boiss. Fl. Orient. v. p. 681 (1884). *L. speciosum* Stev. in M. Bieb. Fl. Taur. Cauc. i. p. 80 (1808).

Mossamedes.—Vulgar name Ioio. Not yet plentiful among cultivated cereals and without doubt originally introduced with these. Cavalheiros ; Aug. 1859. No. **2617**.

70. **TRITICUM** L. ; Benth. & Hook. f. Gen. Pl. iii. p. 1204.

1. **T. sativum** Lam. Fl. Franc. iii. p. 625 (1778), Encycl. Meth. ii. p. 554 (1786) ; Durand & Schinz, Consp. Fl. Afr. v. p. 939.

*T. vulgare* Vill. Hist. Pl. Dauph. ii. p. 153 (1787) ; Steud. Syn. Pl. Gram. p. 341 (1854).

Pungo Andongo.—Cultivated on the banks of the river Miége near Caghuy ; 25 Feb. 1857. No. **2778**.

71. **HORDEUM** L. ; Benth. & Hook. f. Gen. Pl. iii. p. 1206.

1. **H. vulgare** L. Sp. Pl. p. 84 (1753).

Var. **tetrastichum** Kœrn. Handb. Getreid. i. p. 147 (1885) ; Durand & Schinz, Consp. Fl. Afr. v. p. 942.

Huilla.—Cultivated by the colonists of Lopollo ; in fr. May 1860. No. **2693**.
Mossamedes.—Cultivated at Cavalheiros; Aug., Sept. 1859. No. **2623**.

Tribe XV. *PHAREÆ*.

72. **OLYRA** L. ; Benth. & Hook. f. Gen. Pl. iii. p. 1110.

1. **O. latifolia** L. Syst. ed. x. p. 1261 (1759) ; Benth. in Hook. Niger Fl. p. 558 (1849).

*O. brevifolia* Schum. in Dansk. Vidensk. Selsk. iv. p. 176 (1829) ;

Benth., *l.c.* *O. paniculata* Sw. Observ. p. 347 (1791); Steud. Syn. Pl. Gram. p. 35 (1854).

PRINCE'S ISLAND.—Pico de Papagaio at about 1200 ft.; Sept. 1853. No. **2932***b*.

SIERRA LEONE.—Sept. 1853. No. **2938**.

GOLUNGO ALTO.—A high climbing grass, 12-15 spans and more, with a hollow culm, marked in its lower part with dark purple transverse rings. Everywhere by streams in dense thickets on the slopes of the mountains of Alta Queta; in fr. 31 Dec. 1854. No. **2998**. A fine grass, climbing widely among thickets; anthers purple very caducous. In thick damp woods, by streams, Queta mountains; in fl. March 1856. No. **7236**. No. **7175** (no information).

73. **LEPTASPIS** R. Br.; Benth. & Hook. f. Gen. Pl. iii. p. 1110.

1. **L. cochleata** Thw. Enum. Pl. Zeyl. p. 357 (1864).

*L. conchifera* Hack. in Bolet. Soc. Broter. v. p. 211. t. 6. fig. A. (1887); Durand & Schinz, Consp. Fl. Afr. v. p. 788.

ISLAND OF ST. THOMAS.—In very shady places with *Marattia* on Mt. Caffé; Dec. 1860. No. **2887**.

PRINCE'S ISLAND.—In the dried up bed of streams on the higher parts of Pico de Papagaio, but rather rare; Sept. 1853. No. **2925**.

GOLUNGO ALTO.—A grass 3 to 4 ft. high, almost a shrub, with bug-like violet-purple spikelets. Leaves papery, dry, hard. In very thick and primæval forest by streamlets dried up in summer on the mountains of Alto Queta; Dec. 1854. No. **2997**. No. **7218** (no information).

74. **PHYLLORACHIS** Trimen; Benth. & Hook. f. Gen. Pl. iii. p. 1108.

1. **P. sagittata** Trimen in Journ. Bot. xvii. p. 353, t. 205 (1879); Durand & Schinz, Consp. Fl. Afr. v. p. 787.

PUNGO ANDONGO.—Sandy woods on the larger island of Calemba, river Cuanza; March 1857. No. **7399**.

TRIBE XVI. *BAMBUSEÆ*.

75. **OXYTENANTHERA** Munro; Benth. & Hook. f. Gen. Pl. iii. p. 1211.

1. **O. abyssinica** Munro in Trans. Linn. Soc. xxvi. p. 127 (1868); Durand & Schinz, Consp. Fl. Afr. v. p. 945.

*Bambusa abyssinica* A. Rich. Tent. Fl. Abyss. ii. p. 439 (1851); Steud. Syn. Pl. Gram. p. 330 (1854).

PUNGO ANDONGO.—Culms unarmed, 25 to 30, more rarely 40 or 50 ft. high, gregarious, glaucous-pruinose, 1½ to 3 in. in diameter at the base. Rather plentiful near rivers in the primitive woods between Pungo Andongo and Candumba, near Mangue, Mutollo, Candumba, etc. In immature fr. end of Mar. 1857. No. **1134**. The tops of a flowering culm 22 ft. high, leafless, and clothed only with very large coriaceous broadly mucronate sheaths. In dense woods on the river Quiambungo; end of March 1857. No. **2803**. In woods near Candumba; March 1857. COLL. CARP. 1109. See also Welw. Synops. Explic. p. 38 (1862).

**Graminea** indet.

PUNGO ANDONGO.—A perennial. On the rocks of the præsidium; April 1857. No. **7401**.

In absence of inflorescence it is impossible to determine the genus of the above specimen.

**Planta** indet.

In absence of adequate material it is impossible to determine even the natural order of the following:—

PUNGO ANDONGO.—? Orchidea. ? Aroidea. ? Liliacea. A small bulbous herb, bulb ovate-conical solid, leaves somewhat fleshy, petioles sheathing and spotted with red at the base, blade cordate-ovate, subcoriaceous, shining. Rather rare in clayey thickets near Luxillo; without fl. Dec. 1856. Plentiful in light thicket-grown woods near the præsidium, but from Oct. 1856 to June 1857 never seen in flower. No. **740**.

**Addendum** (see p. 84).

**Hyphaene benguellensis** Welw. Synops. Expl. p. 40 (1862).

*Hyphaene* sp. Welw. Apont. p. 545 (1859).

MOSSAMEDES.—Mateba. COLL. CARP. 1055. A fibre specimen.

# GYMNOSPERMS.

## I. GNETACEÆ.

1. **TUMBOA** Welw. in Gard. Chron. 26 Jan. 1861, p. 75.

*Welwitschia* Hook. f. in Gard. Chron. 25 Jan. 1862, p. 71; Benth. & Hook. f. Gen. Pl. iii. p. 418 (1880).

1. **T. Bainesii** Hook. f. in Gard. Chron. 16 Nov. 1861, p. 1008.

*T. strobilifera* Welw. ex Hook. f. in Gard. Chron. 1862, *l.c.* *Welwitschia mirabilis* Hook. f. in Gard. Chron. 1862, *l.c.*, in Trans. Linn. Soc. xxiv. p. 7, tt. 1-14 (1863); Parl. in DC. Prodr. xvi. pt. 2. p. 360 (1868); Durand & Schinz, Consp. Fl. Afr. v. p. 948.

MOSSAMEDES.—On a great plain about 350 ft. above the sea between Rio Caroca and Praia da Amelia, and growing plentifully and gregariously on the high stony coarse sandy plain at 350 ft. elevation between Cabo Negro and Mossamedes; in fl. and fr. Sept. 1859. No. **1223**.

2. **GNETUM** L.; Benth. & Hook. f. Gen. Pl. iii. p. 419.

1. **G. africanum** Welw. in Trans. Linn. Soc. xxvii. p. 73 (1869); Durand & Schinz, Consp. Fl. Afr. v. p. 948.

*Gnetum* sp. Welw. Apont. p. 545 (1859).

GOLUNGO ALTO.—A slender high-climbing shrub, supported by its twining stem and spreading-reflexed branches; leaves edible and chewed. Called everywhere by the negroes N-coco. Sporadic in the primæval woods of Serra de Alto Queta, somewhat rarely met with owing to the leaves being eaten every year by the negroes. Near Cacuso; in bud 8 Oct. 1855; growing sparsely by the higher dense thickets near the upper road to Capopa; in fl. beginning of Feb. 1856. No. **1224**. In very dense and shady woods of Serra de Alto Queta; in plentiful fl. Jan. 1856. No. **1225**. A narrow-leaved form.

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